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ABSTRACT

This study on reforms and new trends in medical undergraduate education in Europe consists of nine national reports. In these reports prominent medical educators assess the current situation in their respective home countries: Federal Republic of Germany, France, Italy, Netherlands, Spain, Sweden, Switzerland, Turkey, and the United Kingdom. In the individual chapters, medical undergraduate education is discussed in relation to the health needs of society and to premedical, postgraduate and paramedical training. Legal and administrative aspects are also considered. The result is a broad and varied summary of the problems, debates and proposed remedies in medical education in a cross-section of Europe. (MJM)

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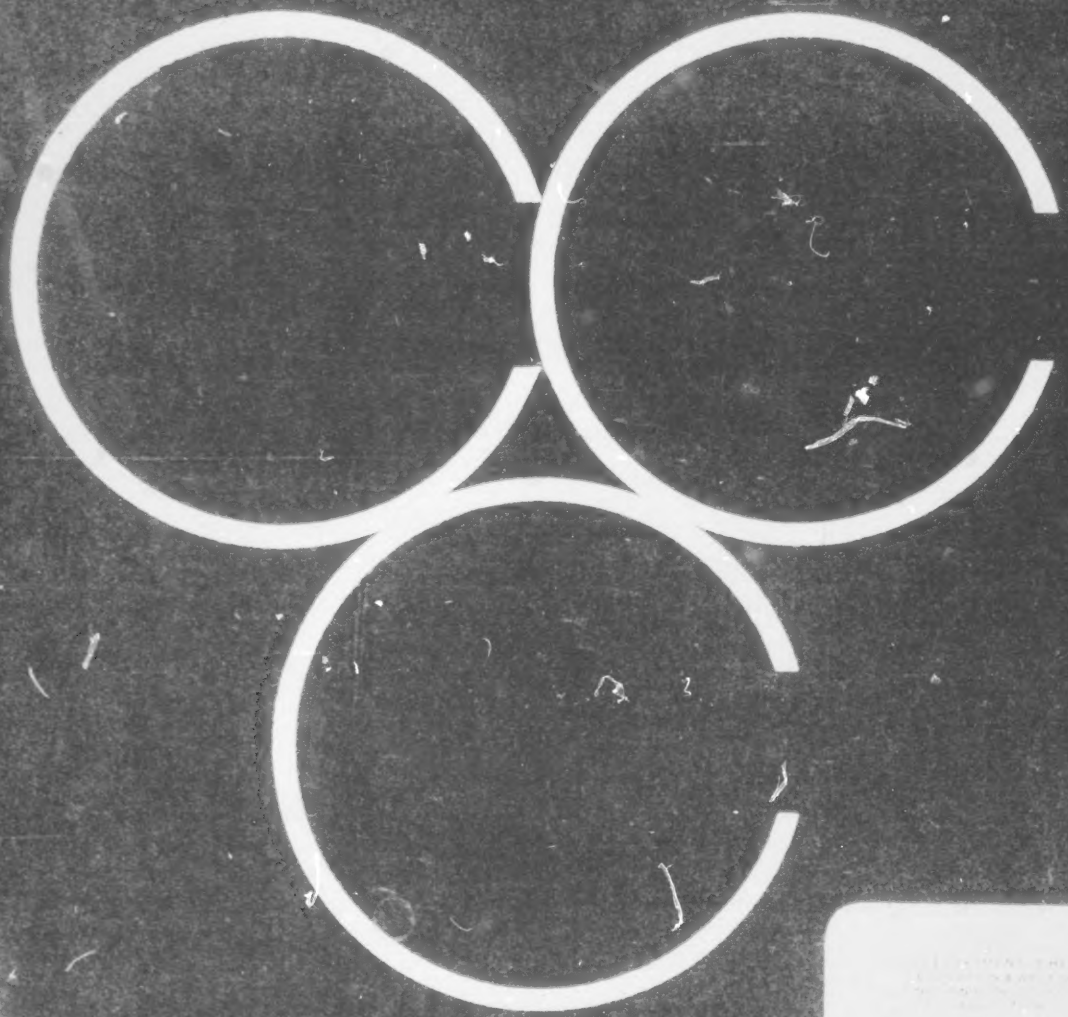

REFORMS AND NEW TRENDS IN MEDICAL UNDERGRADUATE EDUCATION

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Council for Cultural Co-operation
Council of Europe
Strasbourg
1973

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Some of the volumes in this series have been published in French by Armand Colin of Paris and in English by Harraps of London.

These works are being supplemented by a series of "companion volumes" of a more specialised nature to which the present study belongs.

General Editor:

The Director of Education and of Cultural and Scientific Affairs,
Council of Europe, Strasbourg (France)

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(1) For complete list, see back of cover.

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INTRODUCTION

The present study on reforms and new trends in medical undergraduate education in Europe consists of 9 national reports. In these reports prominent medical educators assess the current situation in their respective home countries: Federal Republic of Germany, France, Italy, Netherlands, Spain, Sweden, Switzerland, Turkey and United Kingdom.

The authors have gone about their tasks in different ways. Hence, in the individual chapters, medical undergraduate education is discussed in relation to the health needs of society, and to premedical, postgraduate and paramedical training. Legal and administrative aspects are also considered. The result, therefore, is a broad and varied summary of the problems, debates and proposed remedies in medical education in a cross-section of Europe. Much the same problems and discussions are met with in the other European countries. The present material may, thus, be regarded as representative for the current trends in European medical education on the whole.

The critical appraisal of medical education now underway in the European countries is part of a worldwide reckoning with traditional, pre-world-war II concepts. Thus, it is generally recognised that it is no more possible, desirable or necessary to produce at graduation an omnipotent physician fully prepared for an all-encompassing practice of medicine.

In the formulation of new goals for medical undergraduate education we must try to anticipate the position of medicine in tomorrow's society - a nineteen-year old student entering medical school this year can be expected still to be active as a doctor in the year 2020.

We must then count with an accelerating rate of expansion of medical science including practical advances, and with a great diversity of activities in which physicians will participate.

To cope with this increasing complexity we must base the practice of medicine on a thorough system of specialisation and planned postgraduate training for all. The aim of medical undergraduate education should therefore be reoriented towards - quoting from one of the reports - producing "a medically well-educated, rather than a fully instructed man, who will have experienced a sufficiently wide range of medical activities to be able to make a well-informed choice as to the direction of his future medical career".

The Rapporteur Général is indebted to Mrs Pia Grönwall and Dr. Sally Long for their assistance in revising the manuscripts and to Mrs Inger Åhrén and Mrs Sonja Ohlson for preparing the material for offset printing.

Stockholm June 1972

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The report of the meeting on "Reform of medical education", held in 1972 by the Committee for Higher Education and Research of the Council of Europe is appended.

CHAPTER 1

FEDERAL REPUBLIC OF GERMANY

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1. PRESENT SYSTEM OF MEDICAL EDUCATION

1.1 The medical schools (faculties). Since the Middle Ages, medical schools in Germany have formed part of the university (faculties). This has influenced their outlook and teaching methods and meant that greater importance is attached to educating scientists than to training doctors (physicians). Excessive emphasis is placed on theory and the practical side is neglected for fear that medical schools become vocational (professional) training establishments.

A clear distinction is made between theory and practice, the former being taught at "institutes", most of which have no connection with the university clinics. All university clinics, like city hospitals, provide general medical care for the public at large and seldom have the possibility to select patients of interest from the teaching or research angles. Overburdened with routine duties, teachers and assistants at the clinics are still expected to be physicians, researchers and teachers at one and the same time and to divide their working day between these 3 tasks. Lack of contact with the theoretical institutes has encourated a tendency for university clinics to carry out basic laboratory research, with unfavourable repercussions on medical treatment, research and teaching.

So far medical faculties have been unaware of, or failed to undertake, research or practical work in the field of social medicine, possibly in the form of "community medicine" and there is no co-operation between the university clinics and other hospitals, practising physicians or health officials.

1.2 The teachers. Medical studies start with a one-year natural science course in Physics, Chemistry, Zoology and Botany, which are the responsibility not of the medical but of the natural science faculty. Teachers in these subjects therefore pay little attention to the needs of medical students, most of whom have received insufficient grounding at upper secondary school and thus find it difficult to master natural science subjects sufficiently.

There are 3 categories of teachers at the medical faculties:

a. Theoreticians without contact with clinical problems (anatomists, physiologists and, until recently, pharmacologists).

b. Theoreticians coming into contact with clinicians (pathologists and microbiologists).

c. Clinicians and specialists of all kinds (experts in internal medicine, surgeons, gynaecologists, psychiatrists etc).

All faculty members are nominally full-time civil servants. There is, however, a difference between theoreticians and clinicians: the latter earn their full-time salary many times over by giving private consultations. As a considerable amount of their time is devoted to this private practice, they are in reality only part-time university teachers and divide their working hours between private practice, health-service patients at the clinic, and administrative duties, research and teaching. In addition, they are expected to organise and

supervise the fairly large staff of physicians under their authority.

The hierarchical structure of the clinics and institutes is also true of teaching: the "full-professor" usually decides what should be taught, how and by whom, and often gives all the most important lectures himself. Only in recent years have there been any signs of greater flexibility.

In addition, teaching motivation is seriously affected by a prestige scale ranking research above all else. Teaching plays no role in a university career and appointments to a university chair involving the running of a clinic or institute are made solely on the basis of research performance, reflected in the amount of print produced by the applicant. Only minor importance is attached to skill as a physician and teaching ability is taken for granted. Accordingly, when younger scientists spend time over their students, they are doing so to the deteriment of their professional career.

1.3 The students. An upper secondary school diploma (Abitur) is required for entrance to the medical faculty. This certificate is obtained by passing an examination following 12-13 years' schooling. The average age of applicants to medical schools is between 18 and 20 years old.

Recently overcrowding has made it necessary to restrict admission. Applicants are selected according to a system of points calculated according to Abitur grades in certain subjects, and the year the diploma was obtained. A small proportion of places is reserved for social hardship cases. All applicants are required to contact the Central Registration Office which calculates their points and forwards these, along with their applications, to the medical faculty. The number of students accepted depends on the places available at the individual faculty concerned which so far has depended less on rational criteria than on haphazard student growth in the past.

According to statistical surveys carried out by the Scientific Council (1) ("Wissenschaftsrat") the number of medical students has increased from somewhat under 10,000 students in 1955 to almost 30,000 in 1965 (2,046 students started medical courses in 1955 as compared to 5,166 in 1965). This increase in admissions was accompanied by a tendency for students to take more time to complete their studies.

There is no far-reaching educational planning in the Federal Republic of Germany. Pupils at upper secondary schools study a wide variety of subjects which are not geared to university requirements and therefore enter university with a very different - and usually inadequate - basic educational background.

During their university studies they are largely on their own. Advisory and tutorial systems seldom exist and then only at the beginning stage.

1.4 The lawmakers. In the Federal Republic of Germany, the medical curriculum is regulated by government decree ("Rechtsverordnung"), which involves highly complex machinery. The 5 separate authorities involved, some federal and others in the Länder, are poorly co-ordinated and incompetent to decide regarding subject matter. The medical faculties have almost no influence on their decision.

The Federal Parliament ("Bundestag") lays down the Federal Certification Regulations for Doctors ("Bestallungsordnung für Ärzte") which constitute a legal framework defining the duration of medical studies, the number of examinations and the practical "internship" necessary for a licence to practise medicine.

The Federal Ministry of Health lays down supplementary provisions, dealing with medical education in detail.

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(1) Recommendations for structure and expansion of medical research and teaching institutes, 1968, p. 255.

The Ministries of Internal Affairs of the Länder are responsible for awarding licences and therefore also for examinations. They set up boards at the medical schools responsible for conducting examinations.

The Ministries of Education of the Länder act as governors of the medical schools, and decide on the budgets for personnel, premises and equipment necessary for teaching, research and medical care.

The Ministries of Finance of the Länder take the final decision in financial matters.

This system of allocating responsibilities is very clumsy, especially as both Federal and Länder authorities are involved. The faculties play no part in drawing up and developing curricula, especially as the Federal Certification Regulations ("Bestallungsordnung für Ärzte") gives teaching authorisation to representatives of the university departments (disciplines) concerned and not the faculties. This has 2 consequences:

Firstly, the "Bestallungsordnung" confers power and privileges not on the medical schools (faculties) but on the departments, which thus have the right to run institutes and clinics with their staff and equipment budgets. These privileges lead to the development of "poor" and "rich" departments yet all unite to postpone for as long as possible the emergence and escape of new specialised fields of study out of reach of their protected powers.

Secondly, the "Bestallungsordnung" impedes unified teaching. Teachers in the university departments enjoy such independence that they can plan their teaching without taking into account related subjects or the curriculum as a whole. Nor do the faculties have the power to stand up to the departments or the staff to plan and experiment with new teaching methods. Their leadership lacks continuity as they only have a Dean who changes every year and takes on this job as a supplementary duty on top of all his other obligations. Inter-departmental plans to co-ordinate and integrate teaching have so far not been developed or enforced, and the curricula are therefore little more than time-tables based on the requests of department heads and drawn up by the Dean's secretary. Until recently, research in medical education was unknown.

1.5 Duration and programme of studies. The aim of medical studies is only very briefly defined in Section 3 of the "Bestallungsordnung": "The aim of medical education is to produce a physician capable of carrying out his work".

There are 3 stages, extending over a minimum of 11 semesters, 5 pre-clinical and 6 clinical. The pre-clinical part begins with an initial course lasting at least 2 semesters (Section 22,2) ending with the first examination - the basic natural science examination which corresponds to a first MB ("Vorphysikum"). The following courses are compulsory (Section 22,4): "One-semester courses in zoology and botany and 2 semester courses in physics and chemistry. A one-semester laboratory course in both physics and chemistry is also compulsory".

Teaching objectives are only defined very briefly (Section 25,3). The student "must give proof of such knowledge in physics and chemistry as is necessary for his future work as a physician, while in zoology and botany he should acquaint himself with the essentials of general biology with special reference to the most important medical herbs and parasites of the human body".

The basic natural science examination is followed by a 3-semester period during which, under Section 31,4, the following courses must be taken: "One semester courses in histology and developmental history, 2-semester courses in physiology and physiological chemistry and a 3-semester course in anatomy". In addition, the student must take the following practical courses: "One-semester practical courses in physiology, physiological chemistry and microscopic-anatomy and a 2 semester laboratory course in anatomical preparations". Here too, the teaching aims are cursorily defined. Only standards in anatomy are described

with greater precision (Section 33,3) while the other courses are referred to as follows (Section 33,4): "In the physiology and physiological chemistry examinations the student must show a command of physiology as a whole, including medical psychology, physiological chemistry and important medical equipment, methods of examination and test reactions". Interestingly enough, medical psychology is examined by physiologists. As a result, the subject is seldom taught and almost never examined.

The basic medical examination ("Physikum", equivalent to a second MB) is followed by 6 semesters' clinical practice, during which the following are compurlosry (Section 40,1 (a)): "general and special pathology, topographical anatomy, legal medicine, including medical insurance, medical law and profession, physical medicine, history of medicine, health and welfare, industrial medicine, medical X-ray as well as 2 semester courses in pharmacology and hygiene".

Teaching at the clinics consists almost exclusively of lectures: compulsory (Section 40,1 (b)): "one semester lectures in dermatology, eye diseases, ear, nose and throat diseases, psychiatry, neurology, at medical, surgical, orthopaedic and dental policlinics, and 2 semester lectures at medical, surgical, obstetrical, gynaecological and pediatric clinics".

Students have to help deliver 4 babies and attend practical courses in auscultation and percussion, clinical chemistry, obstetrical gynaecological examination, obstetrical surgical techniques, use of the opthalmoscope and otoscope, medical prescription, pathological-anatomical demonstrations and courses in autopsy, bacteriological serology and inoculation.

Again only a brief definition is given of the teaching objectives of clinical training in each specific subject (Sections 45-56).

The university course ends with the final medical examination ("Staatsexamen") but 2 years internship is required before a licence to practise medicine is given.

This system has 2 consequences:

a. Medical schools postpone practical experience until after the final medical examination. Students therefore learn theory during their studies for the purpose of passing the examinations and afterwards have to learn the practical side, divorced from the theoretical. Their period of internship is not supervised or planned by the faculties. Only a few interns are trained at university clinics while the others enter general or city hospitals. What knowledge and skills they acquire during this period is entirely a matter of chance and individual initiative.

b. The intern is in a hybrid position: he is supposed to learn medical skills yet at the same time, on legal grounds, is not allowed to practise (since he is not yet a physician). Experiences have proved so unsuccessful that plans are currently under way to abolish internship.

1.6 Teaching methods. Medical teaching consists almost exclusively of lectures given by teachers from the departments, whose ambition is often to cover their entire field. The Certification Regulations provide for clinical training in the form of "practising" but the only consequence is that attendance at lectures is checked.

The Certification Regulations (Section 30,12) specifies a 30:12 ratio of lectures to practical courses, ie one practical hour for every 24 lecture hours. In fact, practical work and courses are so hamstrung by the large number of students that they seldom fulfil their purpose.

In addition to the lectures and practical courses laid down in the Certification Regulations, there are additional specialised lectures, usually given by younger teachers. Attendance at these lectures is voluntary.

Hospital training in the sense of the United States' "Clerkship" is unknown in the Federal Republic. Although so-called "clinical visits" are a form of lecture given at the patient's bedside, the student is unable to participate actively in examining the patient, or in decisions concerning diagnosis or treatment.

1.7 Examinations. The Certification Regulations require oral examinations and specify (Section 10) that "only 4 students may be examined by one examiner". There are therefore no written examinations and an attempt by some faculties to introduce them was blocked by a decision taken by the Supreme Administrative Court, on the basis of the legal force of the Certification Regulations.

The grading system is complex. There are 6 different grades (excellent, good, satisfactory, below standard, unsatisfactory, failure) and a complicated system of assessing points, in which some subjects are considered more important than others, determines pass or failure.

Altogether 20 examinations have to be passed in the various subjects (Sections 25, 33, 44): 4 subjects for each of the pre-clinical periods and 12 subjects for the clinical period.

All 3 examinations, the basic natural science examination ("Vorphysikum"), basic medical examination ("Physikum") and final medical examination ("Staatsexamen") include compulsory oral examinations. These 3 examinations are incredibly time-consuming. Two and a half months are reserved for the final medical examination alone under the Certification Regulations, and this examination actually drags on much longer, especially as students try to prepare themselves between times for examinations in the next subject. The amount of time required bears no relation to effectiveness as teachers use their time for conducting but never for preparing examinations.

2. REFORMS IN MEDICAL EDUCATION

2.1 Need for reforms. The Certification Regulations governing medical studies at present were supplemented in 1955, 1957, 1958 and 1963, to take account of new developments and remedy countless problems. It has now become clear that this procedure is no longer viable. Two draft revisions of the Certification Regulations stirred up such resistance from all parties concerned, that they had to be withdrawn. The Federal Ministry of Health then decided to set up a committee, consisting of representatives of the faculties, the Scientific Council, professional medical organisations, hospital associations, the Länder Ministries of Internal Affairs and of Education and the student body. The work of this "Selective Committee" ("Kleine Kommission") led to recommendations reflected in a further draft proposal by the Federal Ministry of Health.

Even during the preparatory stage, it became clear that the Medical Profession Act ("Bundesärzteordnung") had to be changed as it was the legal basis for any ministerial decree making far-reaching reforms possible. In the meantime a change in the Medical Profession Act was passed by the Federal Parliament, superseding the old Certification Regulations.

The new decree, called "Regulations governing admission to the medical profession" ("Approbationsordnung") instead of "Certification Regulations" ("Bestallungsordnung") has not yet been passed. Teaching therefore continues under the old system.

It is hard to forecast what the new regulations will entail, but it is obvious that it will be a few years before many of the reforms recommended by the Selective Committee (SC) can be introduced. The staff, facilities and equipment necessary for their implementation must be found. The future of medical education

in the Federal Republic of Germany undoubtedly depends on the readiness of individual Länder to obtain the requisite financial resources.

2.2 Aims of the reform (Selective Committee see Post-Scriptum on p ..). One of the most important points for which the Selective Committee battled was limitation of government control over courses so as to enable the faculties to draw up new curricula which could only be done by making the new Regulations refer to examinations rather than studies. They should accordingly define educational aims, the duration of courses and the number and procedure of examinations, but no longer specify lectures for certain subjects.

Educational aims should merely consist of inculcating a basic knowledge of medicine and should be defined in general terms to that they can be adapted to future developments. One draft proposal spelled out in its first paragraph: "The aim of medical education is the scientific training of a physician familiar with the essentials and methods of medical thinking, knowledge and action, so as to be capable of exercising the medical profession independently". This paragraph was subsequently deleted. Unfortunately educational aims will not be defined in the new Regulations. The wording of the National Regulations (Section 1,1) is regarded as sufficient: "The physician works for the health of each individual and of the whole nation".

The educational objectives of the different periods of study are to be defined in greater detail in an appendix to the new Regulations. This Selective Committee proposal reveals the basic obstacles facing legal provisions regarding courses of study in a country where professional training be regulated by law. It is virtually impossible to word decrees in sufficiently general terms so that they will not impede future development. This leads time and again to unsatisfactory compromises. The Selective Committee has therefore proposed a procedure which at least provides for an indirect approach: educational aims are to be defined only through describing the subjects to be taught during the different periods of study and boards of specialists should be responsible for defining teaching objectives. The decree should specify that the list of teaching objectives be adapted constantly to the development of medical science and published at regular intervals.

The Selective Committee was aware that a solution of this kind was only possible if the examination system was radically reformed and included written examinations. It recommended compulsory written examinations with 2 aims in mind:

Firstly, that the Länder should set up a joint institute to set examination questions, working along similar lines to the National Board of Medical Examiners in the USA.

Secondly, that boards of specialists from the medical faculties should be asked to list teaching aims with a view to future changes in the curriculum. Examination questions would take account of these objectives and be drawn up with the assistance of the examination institute.

This complex procedure whereby a decree achieves its objective only by indirect methods which it does not specify is necessary because of the legal structure of federalism; the Federal Government is not allowed to impose anything on the Länder which affects their sovereignty. Accordingly, it is not yet certain whether this proposal will be accepted and if so, in what form. Although the Länder are willing to set up a central examination institute, there are considerable difficulties as lawyers on the administration wish to lay down procedures for written examinations and pass requirements in such detail that it would be very awkward if not impossible, to organise examinations, and in any event impossible to modify examination procedure at a later date. As this factor is decisive if the new Regulations are to lead to reforms in medical education, it is to be hoped that a rational solution will be found despite resistance.

Further Selective Committee recommendations concern the introduction of clinical work into medical training. To ensure a more effective balance between theory and practice in the future, the number of practical courses and the size of groups should be regulated.

It is also planned to introduce a practical year during the course when the student would spend all day on the ward (corresponding to the "internship" in Anglo-Saxon countries). This would replace the internship period at the end of the course and reduce medical training from 8 to 6 years.

Finally, it is proposed that the final medical examination be divided into 3 parts and the first MB ("Vorphysikum") abolished.

Under this scheme, the medical course would in future comprise the following 4 stages:

- a pre-clinical course of at least 2 years, leading up to the second MB ("Physikum");
- one year of clinical-theoretical instruction followed by a written examination;
- a 2 year course in clinical subjects, ending with a written examination;
- a practical year, of which 4 months would be spent at medical clinics, 4 months at surgical clinics and a final 3 months either at clinics or theoretical institutes, as the student wished. This stage would culminate in the last part of the final medical examination, which would be both oral and written. Students passing this examination would be given a licence to practise.

3. LIKELY STRUCTURE OF THE FUTURE CURRICULUM

The first stage. (Pre-clinical training) would take 2 years and cover 7 subjects: physics and chemistry for medical students, biology, biomathematics, medical psychology and sociology, anatomy, physiology and biochemistry. By abolishing the basic natural science examination (first MB), the faculties would be able to integrate physics and chemistry into the physiology and biochemistry courses.

This stage would also include 10 practical courses (courses, laboratory work and seminars) organised in small groups: physics and chemistry for medical students, cell biology, medical terminology (replacing the previous course in Latin), macroscopic and microscopic anatomy, physiology and biochemistry.

The second stage (first part of clinical training) would take at least one year and cover 4 groups of subjects: general pathology, pathophysiology and pathobiochemistry; medical microbiology and clinical radiology (a somewhat heterogeneous combination); pharmacology, toxicology and human genetics, and an introduction to clinical examination techniques and the underlying theory.

The following practical courses would be taught in small groups: pathology, clinical chemistry and hematology, microbiology, X-ray protection, pharmacology, general clinical examination methods (surgical and non-surgical) and practical treatment in cases requiring emergency first aid.

The third stage (the second clinical period) would take at least 2 years and cover 5 groups of subjects:

Non-surgical subjects including internal medicine, pediatrics, dermatology and urology (if teachers in the last field so wish).

Surgical subjects including surgery, gynaecology, orthopaedics, otholaryngology, opthalmology and dentistry.

Neuropsychiatric subjects including neurology, neurosurgery, psychiatry, psychosomatic medicine and psychotherapy.

A special group of ecological subjects would also be taught: social, legal and industrial medicine.

Practical courses in pathology and the various clinical subjects would be organised in small groups.

The practical year would include hospital training at medical and surgical clinics supplemented by clinico-pathological lectures and seminars in clinical pharmacology and clinical microbiology.

4. PROSPECTS

The draft regulations outlined above are a compromise between the faculties' desire for maximum flexibility in the structure of the curriculum and the lawmakers' desire for government control.

Interim examinations in certain subjects certainly make it difficult to integrate and overlap the various stages as desirable and to structurise or develop the curriculum on the basis of teaching experience. Also, by backing the claim of various departments to provide practical courses during certain stages, co-ordination and integration of subject matter could be held back.

On the other hand, it should be realised that in the Federal Republic experiments drawing up curricula which can be empirically assessed have only just begun and that so far, there has been no experience on which to build. The faculties do not at the moment have the necessary staff or structures to undertake any radical reform within the near future. The introduction of the reforms proposed in the new decree would in itself mean an additional burden which could only be shouldered by the faculties if the student:teacher ratio is improved and special conditions, lacking at present, are met. Hitherto, there have been no structures making it possible to overlap subjects and departments and these must first be found, since they are vital to the implementation of the proposed reforms as a means of planning the curriculum and checking and evaluating teaching results. The idea of a curriculum laid down by the faculty, which would inevitably limit the professor's freedom of teaching by defining his teaching objectives, is so new and unusual in the Federal Republic of Germany, that the necessary adaptation will undoubtedly take several years.

Under these circumstances, objections to the compromises set out in the proposals for the new Regulations are not too serious. Government decrees cannot force reforms but at worst impede them and at best pave the way for change.

However, it is essential that the future Regulations governing admission to the medical profession should be modified at regular intervals on the basis of experience accumulated and assessed by the faculties. Co-operation between specialist medical education groups from all medical faculties is necessary to this end and the necessary staff and resources must be provided. So far, only a few such groups exist. Discussions in connection with the introduction of written examinations can be hoped to result in the definition of teaching aims and their constant assessment within the framework of the curriculum. This might stimulate the setting up and co-operation of such groups and thus lead to a lasting reform.

All things considered, it seems obvious that the introduction of the new Regulations in line with the Selective Committee's recommendations would be a preliminary but essential step towards improving medical education in the Federal Republic of Germany.

The Länder governments and the public at large must be willing to accept the financial sacrifices entailed. Whether they are prepared to do so is still uncertain.

As far as politicians are concerned, the rising number of students is a much more convincing argument that demands for a higher standard of education, which requires considerable resources yet does not increase the numbers of students that the existing faculties can take. Medical faculties have in the past failed to adapt their capacity to the needs of a modern curriculum and to explain to politicians that it is only possible to train more students if new schools are built. It is to be hoped that this failure can be remedied at a time when overcrowding at universities has become a political factor of major importance.

5. OTHER NEW CONCEPTS

Some faculties have made isolated attempts to modernise the curriculum independent of the Selective Committee's efforts in connection with the new governmental Regulations. The reason why such attempts are so scattered is that the curriculum is subject to firm governmental control.

The clinical curriculum has been fairly extensively revised at the Medical Faculty of Hannover and the clinical stage of the course is divided into 3 stages of instruction:

5.1 General propedeutical introduction. During this 3 semester period, the student learns the basic elements of all important diseases and is introduced to direct and indirect diagnostical methods. Subject matter has been reorganised after extensive discussions as to the order in which medical subjects could be taught independently of the fields of study concerned. As a result, the motory system of the human body and some knowledge of dermatology are taught first because these subjects give most scope for practical application and natural observation and description. Integrated clinical training, as opposed to an approach geared to separate fields of study, became the main criterion and each theme is presented from a clinical, pathological-anatomical and pathophysiological angle, usually in the course of the same day, by teachers from the various departments.

5.2 Living-in system. The second clinical period lasts 11 months during which the traditional lectures are combined with a 3 month clerkship. During this time, the subject matter taught in the propedeutical semesters should be dealt with at a more advanced level of knowledge, skill and responsibility. The main feature is careful individual tutoring; teaching is designed to encourage students to act responsibly and learn through repetition under different conditions using other methods.

Some changes were necessary. Clinicians' schedules had to be fully coordinated with the students' course programme. The clinics drew up taxonomic instruction plans specifying what the student should master through his individual efforts, what he should learn by observation and where he should train his powers of judgement.

5.3 Polyclinical practical period. The last clinical period repeats the subject matter a third time but under more realistic conditions closer to those of medical practice. The student learns to act more rapidly, self-reliantly, precisely and responsibly under pressure and with restricted diagnostic means. Here, too, the basic principle is learning by repetition, but this time in line with the structures of the polyclinic. As far as possible, subject matter is arranged in "units", thus giving the student an opportunity to concentrate on certain categories of diseases and practise special diagnostic methods.

One important aspect of the Hannover approach is that it integrates all parts of the new regulations which affect practical training at clinics in a manner designed to encourage teaching and motivation.

Patients at clinics and polyclinics are usually a very special group and consequently there is the danger that students may never be confronted with certain of the physician's daily experiences. The curriculum should also attempt to include experience of general practice.

The University of Ulm was the first to think of integrating general medicine into medical education at an early stage, in the form of a programme of house-calls made in the company of general practitioners. The purpose of visiting patients' homes has been summed up as follows:

The student should come into contact with patients at the very beginning of his studies under the supervision of a doctor (especially during the natural science preparatory stage).

From the start, the student should have personal contacts with a physician and see him at work. The process of development from school-leavers to physician should begin as early as possible. The student should understand the reason for acquiring knowledge by seeing it in relation to the patient. Early emotional commitment encouraged by such house-calls might promote serious study.

The aim of the house-call programme is to introduce the student to medicine not exclusively in the form of the corpse on an autopsy table, but through meeting the patient in his home environment. Motivation should be increased, especially with regard to studying pre-clinical subjects, a critical attitude toward rigid diagnostic techniques should be inculcated and the student helped to find his personal identity.

After a seminar introducing students and physicians to the aims of this programme, students accompany general practitioners for several afternoons on their house-calls. Physicians have maximum freedom to make their contacts with the student as easy as possible and after the house-calls, experiences are discussed and enlarged on with teachers of psychosocial subjects. A final seminar attended by all concerned - physicians, teachers and students - concludes the programme. These seminars allow the student to demystify experiences which might otherwise seem shrouded in mystery and are the only way of helping students to check their observations and experiences adequately.

It is intended to continue this programme over several semesters, slightly modifying the aims each time. During the first semester, emphasis is largely on the doctor-patient relationship and the patient in his home environment. In the second semester, simple statistical methods of handling information acquired during general practice are dealt with. A further semester should give the student active experience of work in small laboratories (as soon as the curriculum has provided him with some knowledge of physiology and biochemistry).

So far, the house-call programme has proved promising, although there is no way of assessing it objectively.

These examples of reform trends must be seen in relation to a number of working groups specialised in medical education whose aim is to bring the whole medical curriculum up-to-date. These scattered efforts afford justifiable hope that medical education will slowly be brought into line with the dynamic evolution of science and society.

Post-scriptum

The Selective Committee's basic concepts (see paras VII and VIII above), have become law. The new Regulations governing admission to the medical profession (see appendix) came into force on 3 November 1970, and the remainder on 1 October 1971.

During the transition period, several modifications were made. Under the new Regulations the new medical study course will start as from the 1972-73 academic year.

The medical course now consists of:

1. A pre-clinical course of at least 2 years with an examination in physics, chemistry (adapted for the needs of medical students), biology, biomathematics, medical psychology and sociology, anatomy, physiology and biochemistry.

2. A year of clinical theoretical instruction followed by an examination in general pathology, pathophysiology, pathobiochemistry and basic clinical medicine.

3. A 2 years' course in clinical subjects with a written examination in non-surgical, surgical, neuropsychiatric and ecological subjects.

4. One year of hospital training in surgery and internal medicine, followed by a combined written and oral examination.

A N N E X E

Vom 28. Oktober 1970

Die Verordnung wurde am 3. November im
Bundesgesetzblatt Teil I Nr. 98 S. 1458 verkündet

Auf Grund des § 4 der Bundesärzteordnung in der Fassung der Bekanntmachung vom 4. Februar 1970 (Bundesgesetzblatt I S. 237) und auf Grund des Artikels 2 des Gesetzes zur Änderung der Bundesärzteordnung vom 28. August 1969 (Bundesgesetzblatt I S. 1509) wird mit Zustimmung des Bundesrates verordnet :

Erster Abschnitt

Die ärztliche Ausbildung

§ 1

Gliederung der Ausbildung

1. Die ärztliche Ausbildung umfasst

   1. ein Studium der Medizin von mindestens sechs Jahren an einer wissenschaftlichen Hochschule. Das letzte Jahr des Studiums entfällt auf eine zwölfmonatige zusammenhängende praktische Ausbildung in Krankenanstalten ;
   2. eine Ausbildung in Erster Hilfe ;
   3. einen Krankenpflegedienst von zwei Monaten ;
   4. eine Famulatur von zwei Monaten und
   5. folgende Prüfungen :
      a. die Ärztliche Vorprüfung und
      b. die Ärztliche Prüfung, die in drei Abschnitten abzulegen ist.

2. Die Prüfungen nach Absatz 1 Nr. 5 können abgelegt werden :

   1. die Ärztliche Vorprüfung nach einem Studium der Medizin von zwei Jahren ;
   2. der Erste Abschnitt der Ärztlichen Prüfung nach einem Studium der Medizin von einem Jahr nach Bestehen der Ärztlichen Vorprüfung ;
   3. der Zweite Abschnitt der Ärztlichen Prüfung nach Bestehen des Ersten Abschnitts der Ärztlichen Prüfung und einem Studium der Medizin von drei Jahren nach Bestehen der Ärztlichen Vorprüfung und
   4. Der Dritte Abschnitt der Ärztlichen Prüfung nach einem Studium der Medizin von einem Jahr nach Bestehen des Zweiten Abschnitts der Ärztlichen Prüfung.

§ 2

Unterrichtsveranstaltungen

1. Die Hochschule vermittelt eine Ausbildung, die es dem Studierenden ermöglich ermöglicht, den Wissenstoff und die Fähigkeiten zu erwerben, die in den in dieser Verordnung vorgesehenen Prüfungen gefordert werden. Sie führt über die in den Anlagen 1 bis 3 zu dieser Verordnung vorgesehenen praktischen Übungen hinaus Unterrichtsveranstaltungen durch, die diesem Zweck dienen. Bei der Ankündigung der Unterrichtsveranstaltungen macht die Hochschule kenntlich, dass der Besuch dieser Unterrichtsveranstaltungen die Erreichung des Ausbildungsziels fördert. ./.

2. Bei den praktischen Übungen soll die notwendige praktische Anschauung gewährleistet sein. Soweit der Lehrstoff eine unmittelbare Unterrichtung in kleinen Gruppen erfordert, soll dies angestrebt werden. Bei den praktischen Übungen in den klinisch-praktischen Stoffgebieten soll die Unterweisung am Patienten im Vordergrund stehen. Im übrigen soll der Unterricht, soweit zweckmässig, nicht am einzelnen Fachgebiet, sondern am Lehrgegenstand ausgerichtet werden.

3. Der Studierende weist seine regelmässige und erfolgreiche Teilnahme an den in Absatz 1 genannten praktischen Übungen durch Bescheinigungen nach dem Muster der Anlage 4 zu dieser Verordnung nach.

§ 3

Praktische Ausbildung in der Krankenanstalt

1. Die praktische Ausbildung nach § 1 Abs. 1 Nr. 1 findet nach Bestehen des Zweiten Abschnitts der Ärztlichen Prüfung im letzten Jahr des Medizinstudiums statt. Sie gliedert sich in eine Ausbildung von je vier Monaten.

1. in Innerer Medizin
2. in Chirurgie und
3. wahlweise in einem der übrigen klinisch-praktischen Fachgebiete.

2. Die Ausbildung nach Absatz 1 wird in den Krankenanstalten der Hochschule oder in anderen von der Hochschule im Einvernehmen mit der zuständigen Gesundheitsbehörde bestimmten Krankenanstalten durchgeführt.

3. Auf die Ausbildung nach Absatz 1 werden Unterbrechungen bis zu insgesamt vier Wochen angerechnet.

4. Während der Ausbildung nach Absatz 1, in deren Mittelpunkt die Ausbildung am Krankenbett steht, soll der Studierende die während des vorhergehenden Studiums erworbenen ärztlichen Kenntnisse und Fähigkeiten vertiefen und erweitern. Er soll lernen, sie auf den einzelnen Krankheitsfall anzuwenden. Zur Ausbildung gehört auch die Teilnahme des Studierenden an klinischen Besprechungen einschliesslich der arzneitherapeutischen und klinisch-pathologischen Besprechungen. Um eine ordnungsgemässe Ausbildung zu sichern, sollddie Zahl der Studierenden zu der Zahl der zur Verfügung stehenden Krankenbetten in einem angemessenen Verhältnis stehen. Der Studierende darf nicht zu Tätigkeiten herangezogen werden, die seine Ausbildung nicht fördern.

5. Die regelmässige Teilnahme an der Ausbildung nach Absatz 1 ist bei der Meldung zum Dritten Abschnitt der Ärztlichen Prüfung durch Bescheinigungen nach dem Muster der Anlage 5 zu dieser Verordnung nachzuweisen.

§ 4

Sondervorschrift für die praktische Ausbildung
in Krankenanstalten, die nicht Krankenanstalten
der Hochschule sind

1. Die praktische Ausbildung nach § 3 abs. 1 kann in Krankenanstalten, die nicht Krankenanstalten der Hochschule sind, nur durchgeführt werden, wenn in der Abteilung, in der die Ausbildung erfolgen soll, eine ausreichende Anzahl von Ärzten sowohl für die ärztliche Versorgung als auch für die Ausbildungsaufgaben zur Verfügung steht. Ferner müssen regelmässige klinische Besprechungen einschliesslich arzneitherapeutischer und klinisch-pathologischer Besprechungen sowie die Versorgung durch einen Pathologen gewährleistet sein. Zur Ausbildung auf den Fachgebieten der Inneren Medizin und der Chirurgie sind nur Abteilungen geeignet, die über mindestens achtzig Krankenbetten verfügen. Auf diesen Abteilungen muss ausserdem eine konsiliarische Betreuung durch Fachärzte für Augenheilkunde, für Hal-, Nasen-, Ohrenheilkunde, für Neurologie und für Röntgen- und Strahlenheilkunde sichergestellt sein.

2. Die Durchführung der praktischen Ausbildung setzt ausserdem voraus, dass der Krankenanstalt folgende den Ausbildungsanforderungen entsprechende Einrichtungen zur Verfügung stehen :

1. eine leistungsfähige Röntgenabteilung ;
2. eine fachwissenschaftliche Bibliothek ;
3. eine Prosektur ;
4. ein leistungsfähiges Laboratorium ;
5. ausreichende Räumlichkeiten für Aufenthalt und Unterrichtung der Studierenden und
6. soweit eine Ausbildung in der Inneren Medizin durchgeführt wird, Unterrichtslaboratorien mit einer Grundausstattung, in denen die Studierenden unter der Anleitung eines für diese Aufgabe zur Verfügung stehenden medizinisch-technischen Assistenten oder einer sonst hierzu geeigneten Person Routineuntersuchungen zu Ausbildungszwecken durchführen können.

§ 5

Ausbildung in Erster Hilfe

1. Die Ausbildung in Erster Hilfe (§ 1 Abs. 1 Nr. 2) ist vor der Meldung zur Ärztlichen Vorprüfung zu erwerben. Sie soll durch theoretischen Unterricht und praktische Unterweisungen gründliches Wissen und praktisches Können in Erster Hilfe vermitteln.

2. Als Nachweis über die Ausbildung in Erster Hilfe gilt insbesondere :

1. eine Bescheinigung des Arbeiter-Samariter-Bundes Deutschland e.V. des Deutschen Roten Kreuzes, der Johanniter-Unfall-Hilfe oder des Malteser-Hilfsdienstes e.V.,
2. das Zeugnis über eine abgeschlossene Ausbildung in einem der folgenden Heilhilfsberufe :

   Krankenschwester, Krankenpfleger, Kinderkrankenschwester, Krankenpflegehelferin, Krankenpflegehelfer, Masseur (Masseuse) und medizinischer Bademeister (Bademeisterin), Krankengymnast (Krankengymnastin) ;
3. eine Bescheinigung über die Ausbildung als Schwesternhelferin oder Pflegediensthelfer oder über eine Sanitätsausbildung.
4. eine Bescheinigung eines Trägers der öffentlichen Verwaltung, insbesondere der Bundeswehr, der Polizei oder des Bundesgrenzschutzes, über die Ausbildung in Erster Hilfe ;
5. eine Bescheinigung einer anderen Stelle über die Ausbildung in Erster Hilfe, wenn die Eignung dieser Stelle für eine solche Ausbildung von der zuständigen obersten Landesbehörde oder einer von ihr beauftragten Behörde anerkannt worden ist.

3. Die Teilnahme an einer Ausbildung in Erster Hilfe ist bei der Meldung zur Ärztlichen Vorprüfung nachzuweisen.

§ 6

Krankenpflegedienst

1. Der zweimonatige Krankenpflegedienst (§ 1 Abs. 1 Nr. 3) ist vor Beginn des Studiums oder während der unterrichtsfreien Zeiten des Studiums vor der Meldung zur Ärztlichen Vorprüfung an einer Krankenanstalt abzuleisten. Er hat den Zweck, den Studienanwärter oder Studierenden in Betrieb und Organisation einer Krankenanstalt einzuführen und ihn mit den üblichen Verrichtungen der Krankenpflege vertraut zu machen.

2. Auf den Krankenpflegedienst sind anzurechnen :

1. eine krankenpflegerische Tätigkeit im Sanitätsdienst der Bundeswehr oder in vergleichbaren Einrichtungen,

2. eine krankenpflegerische Tätigkeit im Rahmen eines sozialen Jahres nach den Vorschriften des Gesetzes zur Förderung eines freiwilligen sozialen Jahres vom 17. August 1964 (Bundesgesetzblatt I S. 640), geändert durch das Gesetz zur Änderung des Gesetzes zur Förderung eines freiwilligen sozialen Jahres vom 12. Juli 1968 (Bundesgesetzblatt I S. 805),

3. eine krankenpflegerische Tätigkeit im Rahmen eines zivilen Ersatzdienstes nach den Vorschriften des Gesetzes über den zivilen Ersatzdienst in der Fassung der Bekanntmachung vom 16. Juli 1965 (Bundesgesetzblatt I S. 983), zuletzt geändert durch das Siebente Gesetz zur Änderung des Wehrpflichtgesetzes vom 3. September 1969 (Bundesgesetzblatt I S. 1567),

4. eine Ausbildung in der Krankenpflege oder in der Krankenpflegehilfe.

3. Ein ausserhalb des Geltungsbereichs dieser Verordnung geleisteter Krankenpflegedienst und eine ausserhalb des Geltungsbereichs dieser Verordnung erworbene Ausbildung in der Krankenpflege sind anzurechnen.

4. Die Ableistung des Krankenpflegedienstes ist bei der Meldung zur Ärztlichen Vorprüfung nachzuweisen. In den Fällen des Absatzes 1 Satz 1 erfolgt der Nachweis durch eine Bescheinigung nach Anlage 6 zu dieser Verordnung.

§ 7

Famulatur

1. Die zweimonatige Tätigkeit als Famulus (§ 1 Abs. 1 Nr. 4) ist während der unterrichtsfreien Zeiten des Studiums zwischen der Ärztlichen Vorprüfung und dem Zweiten Abschnitt der Ärztlichen Prüfung abzuleisten. Sie hat insbesondere den Zweck, den Studierenden mit dem ärztlichen Wirken in öffentlichen Stellen und in Einrichtungen des Arbeitslebens sowie in freier Praxis vertraut zu machen.

2. Die Tätigkeit als Famulus wird abgeleistet :

1. unter ärztlicher Leitung

   a. in einer Dienststelle des öffentlichen Gesundheitsdienstes, der Jugendhilfe, der Sozialhilfe, der Arbeitsverwaltung, der Versorgungsverwaltung oder der Gewerbeaufsicht,

   b. in einer Einrichtung der gesetzlichen Unfallversicherung oder der gesetzlichen Krankenversicherung,

   c. in einer Einrichtung der Träger der gesetzlichen Rentenversicherung für die Rehabilitation Behinderter oder die ärztliche Begutachtung einschliesslich des vertrauensärztlichen Dienstes,

   d. in einer werks- oder betriebsärztlichen Einrichtung,

   e. in einer truppenärztlichen Einrichtung der Bundeswehr,

2. in einer ärztlichen Allgemeinpraxis oder

3. in einer ärztlichen Gemeinschaftspraxis.

3. Die Tätigkeit als Famulus ist bei der Meldung zum Zweiten Abschnitt der Ärztlichen Prüfung durch eine Bescheinigung nach Anlage 7 zu dieser Verordnung nachzuweisen.

Zweiter Abschnitt

Allgemeine Prüfungsbestimmungen

§ 8

Einrichtung des Landesprüfungsamtes

Die in dieser Verordnung vorgesehenen Prüfungen werden vor der nach Landesrecht zuständigen Stelle (Landesprüfungsamt) abgelegt.

§ 9

Zuständiges Landesprüfungsamt

Die nach dieser Verordnung vorgesehenen Prüfungen und Prüfungsabschnitte werden vor dem Landesprüfungsamt des Landes abgelegt, in dem der Prüfling im Zeitpunkt der Meldung zur Prüfung Medizin studiert oder zuletzt Medizin studiert hat. Wiederholungsprüfungen werden vor dem Landesprüfungsamt abgelegt, bei dem die Prüfung nicht bestanden war. Ausnahmen können zugelassen werden. Die Entscheidung trifft das Landesprüfungsamt, bei dem die Zulassung beantragt wird, im Benehmen mit dem nach Satz 1 oder 2 zuständigen Landesprüfungsamt.

§ 10

Meldung zur Prüfung

1. Über die Zulassung zu einer Prüfung oder einem Prüfungsabschnitt entscheidet das Landesprüfungsamt.

2. Der Antrag ist schriftlich zu stellen und muss bis zum 20. Februar oder bis zum 20. Juli dem Landesprüfungsamt zugegangen sein. Später eingehende Anträge sind zu berücksichtigen, wenn ein ausreichend erscheinender Grund für die Fristversäumnis glaubhaft gemacht wird und der Stand des Verfahrens die Teilnahme des Prüfungsbewerbers zulässt.

3. Dem Antrag sind jeweils beizufügen :

   1. die Geburtsurkunde,
   2. das Reifezeugnis oder ein von der zuständigen Stelle als gleichwertig anerkanntes Zeugnis,
   3. das Studienbuch oder die an der jeweiligen Hochschule zum Nachweis der Studienzeiten an seine Stelle tretenden Unterlagen,
   4. die Bescheinigungen über die Teilnahme an den nach dieser Verordnung vorgeschriebenen Unterrichtsveranstaltungen,
   5. die in dieser Verordnung vorgeschriebenen besonderen Ausbildungsnachweise sowie
   6. das Zeugnis über das Bestehen der vorhergehenden Prüfung oder des vorhergehenden Prüfungsabschnitts.

4. Hat der Prüfungsbewerber im Zeitpunkt der Meldung zum Dritten Abschnitt der Ärztlichen Prüfung die Ausbildung nach § 3 Abs. 1 noch nicht abgeschlossen, so hat er eine vorläufige Bescheinigung des für die Ausbildung verantwortlichen Arztes vorzulegen, aus der hervorgeht, dass er die Ausbildung bis zu dem Termin der schriftlichen Prüfung abschliessen wird. Die endgültige Bescheinigung nach dem Muster der Anlage 5 zu dieser Verordnung ist unverzüglich nach Erhalt und bis mindestens eine Woche vor Beginn der schriftlichen Prüfung nachzureichen.

5. Sind Anhaltspunkte dafür gegeben, dass beim Prüfungsbewerber ein Grund vorliegt, der zur Versagung der Approbation als Arzt wegen Fehlens einer der Voraussetzungen des § 3 abs. 1 Satz 1 Nr. 2 und 3 der Bundesärzteordnung führen würde, so kann das Landesprüfungsamt die Vorlage weiterer Unterlagen, insbesondere ärztlicher Zeugnisse oder eines Führungszeugnisses verlangen.

§ 11

Versagung der Zulassung

Die Zulassung ist zu versagen, wenn

1. der Prüfungsbewerber die vorgeschriebenen Nachweise nicht beibringt,
2. die Prüfung oder der Prüfungsabschnitt nicht wiederholt werden darf,
3. ein Grund vorliegt der zur Versagung der Approbation als Arzt wegen Fehlens einer der Voraussetzungen des § 3 Abs. 1 Satz 1 Nr. 2 und 3 der Bundesärzteordnung führen würde.

§ 12

Anrechnung von Studienzeiten und Prüfungen

1. Bei studierenden, die Deutsche im Sinne des Artikels 116 des Grundgesetzes oder heimatlose Ausländer im Sinne des Gesetzes über die Rechtsstellung heimatloser Ausländer im Bundesgebiet vom 25. April 1951 (Bundesgesetzblatt I S. 269) sind, rechnet das Landesprüfungsamt auf die in dieser Verordnung vorgesehene Ausbildung, soweit Gleichwertigkeit gegeben ist, ganz oder teilweise an :

1. Zeiten eines im Geltungsbereich dieser Verordnung betriebenen verwandten Studiums,
2. Zeiten eines ausserhalb des Geltungsbereichs dieser Verordnung betriebenen Medizinstudiums oder verwandten Studiums.

2. Unter den Voraussetzungen des Absatzes 1 erkennt das Landesprüfungsamt Prüfungen an, die im Rahmen eines Studiums nach den Nummern 1 und 2 abgelegt worden sind. Dies gilt nicht für Prüfungen, die das Studium abschliessen.

3. Bei anderen Studierenden können die in Absatz 1 genannte Anrechnung und die in Absatz 2 genannte Anerkennung erfolgen.

§ 13

Art und Bewertung der Prüfung

1. Die Ärztliche Vorprüfung sowie der Erste und der Zweite Abschnitt der Ärztlichen Prüfung sind schriftliche Prüfungen. Der Dritte Abschnitt der Ärztlichen Prüfung besteht aus einem schriftlichen und einem mündlichen Teil.

2. Der Dritte Abschnitt der Ärztlichen Prüfung ist bestanden, wenn der schriftliche und der mündliche Teil bestanden sind.

§ 14

Schriftliche Prüfungen

1. In der schriftlichen Prüfung hat der Prüfling in einer Aufsichtsarbeit schriftlich gestellte Fragen zu beantworten. Er hat dabei anzugeben, welche der mit den Fragen vorgelegten Antworten er für zutreffend hält.

Zweiter Abschnitt

Allgemeine Prüfungsbestimmungen

§ 8

Einrichtung des Landesprüfungsamtes

Die in dieser Verordnung vorgesehenen Prüfungen werden vor der nach Landesrecht zuständigen Stelle (Landesprüfungsamt) abgelegt.

§ 9

Zuständiges Landesprüfungsamt

Die nach dieser Verordnung vorgesehenen Prüfungen und Prüfungsabschnitte werden vor dem Landesprüfungsamt des Landes abgelegt, in dem der Prüfling im Zeitpunkt der Meldung zur Prüfung Medizin studiert oder zuletzt Medizin studiert hat. Wiederholungsprüfungen werden vor dem Landesprüfungsamt abgelegt, bei dem die Prüfung nicht bestanden war. Ausnahmen können zugelassen werden. Die Entscheidung trifft das Landesprüfungsamt, bei dem die Zulassung beantragt wird, im Benehmen mit dem nach Satz 1 oder 2 zuständigen Landesprüfungsamt.

§ 10

Meldung zur Prüfung

1. Über die Zulassung zu einer Prüfung oder einem Prüfungsabschnitt entscheidet das Landesprüfungsamt.

2. Der Antrag ist schriftlich zu stellen und muss bis zum 20. Februar oder bis zum 20. Juli dem Landesprüfungsamt zugegangen sein. Später eingehende Anträge sind zu berücksichtigen, wenn ein ausreichend erscheinender Grund für die Fristversäumnis glaubhaft gemacht wird und der Stand des Verfahrens die Teilnahme des Prüfungsbewerbers zulässt.

3. Dem Antrag sind jeweils beizufügen :

   1. die Geburtsurkunde,
   2. das Reifezeugnis oder ein von der zuständigen Stelle als gleichwertig anerkanntes Zeugnis,
   3. das Studienbuch oder die an der jeweiligen Hochschule zum Nachweis der Studienzeiten an seine Stelle tretenden Unterlagen,
   4. die Bescheinigungen über die Teilnahme an den nach dieser Verordnung vorgeschriebenen Unterrichtsveranstaltungen,
   5. die in dieser Verordnung vorgeschriebenen besonderen Ausbildungsnachweise sowie
   6. das Zeugnis über das Bestehen der vorhergehenden Prüfung oder des vorhergehenden Prüfungsabschnitts.

4. Hat der Prüfungsbewerber im Zeitpunkt der Meldung zum Dritten Abschnitt der Ärztlichen Prüfung die Ausbildung nach § 3 Abs. 1 noch nicht abgeschlossen, so hat er eine vorläufige Bescheinigung des für die Ausbildung verantwortlichen Arztes vorzulegen, aus der hervorgeht, dass er die Ausbildung bis zu dem Termin der schriftlichen Prüfung abschliessen wird. Die endgültige Bescheinigung nach dem Muster der Anlage 5 zu dieser Verordnung ist unverzüglich nach Erhalt und bis mindestens eine Woche vor Beginn der schriftlichen Prüfung nachzureichen.

5. Sind Anhaltspunkte dafür gegeben, dass beim Prüfungsbewerber ein Grund vorliegt, der zur Versagung der Approbation als Arzt wegen Fehlens einer der Voraussetzungen des § 3 abs. 1 Satz 1 Nr. 2 und 3 der Bundesärzteordnung führen würde, so kann das Landesprüfungsamt die Vorlage weiterer Unterlagen, insbesondere ärztlicher Zeugnisse oder eines Führungszeugnisses verlangen.

§ 11

Versagung der Zulassung

Die Zulassung ist zu versagen, wenn

1. der Prüfungsbewerber die vorgeschriebenen Nachweise nicht beibringt,
2. die Prüfung oder der Prüfungsabschnitt nicht wiederholt werden darf,
3. ein Grund vorliegt der zur Versagung der Approbation als Arzt wegen Fehlens einer der Voraussetzungen des § 3 Abs. 1 Satz 1 Nr. 2 und 3 der Bundesärzteordnung führen würde.

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1. Bei studierenden, die Deutsche im Sinne des Artikels 116 des Grundgesetzes oder heimatlose Ausländer im Sinne des Gesetzes über die Rechtsstellung heimatloser Ausländer im Bundesgebiet vom 25. April 1951 (Bundesgesetzblatt I S. 269) sind, rechnet das Landesprüfungsamt auf die in dieser Verordnung vorgesehene Ausbildung, soweit Gleichwertigkeit gegeben ist, ganz oder teilweise an :

1. Zeiten eines im Geltungsbereich dieser Verordnung betriebenen verwandten Studiums,
2. Zeiten eines ausserhalb des Geltungsbereichs dieser Verordnung betriebenen Medizinstudiums oder verwandten Studiums.

2. Unter den Voraussetzungen des Absatzes 1 erkennt das Landesprüfungsamt Prüfungen an, die im Rahmen eines Studiums nach den Nummern 1 und 2 abgelegt worden sind. Dies gilt nicht für Prüfungen, die das Studium abschliessen.

3. Bei anderen Studierenden können die in Absatz 1 genannte Anrechnung und die in Absatz 2 genannte Anerkennung erfolgen.

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1. Die Ärztliche Vorprüfung sowie der Erste und der Zweite Abschnitt der Ärztlichen Prüfung sind schriftliche Prüfungen. Der Dritte Abschnitt der Ärztlichen Prüfung besteht aus einem schriftlichen und einem mündlichen Teil.

2. Der Dritte Abschnitt der Ärztlichen Prüfung ist bestanden, wenn der schriftliche und der mündliche Teil bestanden sind.

§ 14

Schriftliche Prüfungen

1. In der schriftlichen Prüfung hat der Prüfling in einer Aufsichtsarbeit schriftlich gestellte Fragen zu beantworten. Er hat dabei anzugeben, welche der mit den Fragen vorgelegten Antworten er für zutreffend hält.

2. Die Prüfungsfragen müssen auf die für den Arzt allgemein erforderlichen Kenntnisse abgestellt sein und zuverlässige Prüfungsergebnisse ermöglichen. Für die Prüfungsgegenstände im einzelnen gelten die Prüfungsstoffkataloge der besonderen Prüfungsbestimmungen.

3. Im Geltungsbereich dieser Verordnung sind für die schriftlichen Prüfungen einheitliche Termine abzuhalten. Dabei sind jeweils allen Prüflingen dieselben Prüfungsfragen zu stellen. Bei der Festlegung der Prüfungsfragen sollen sich die Landesprüfungsämter nach Massgabe einer Vereinbarung der Länder einer Einrichtung bedienen, die die Aufgabe hat, Prüfungsfragen für Prüfungen im Rahmen der ärztlichen Ausbildung herzustellen. Bei der Aufstellung der Prüfungsfragen und der Antworten ist festzulegen, welche Antwort als zutreffend anerkannt wird. Die Landesprüfungsämter können die Gegenstände, auf die sich die Prüfungsfragen beziehen, öffentlich bekanntmachen.

4. Das Landesprüfungsamt kann bei Prüflingen, die die ordnungsgemässe Durchführung der Aufsichtsarbeit in erheblichem Masse gestört oder sich eines Täuschungsversuches schuldig gemacht haben, die schriftliche Prüfung für "nicht bestanden" erklären.

5. Die schriftliche Prüfung ist bestanden, wenn der Anteil der von dem Prüfling richtig beantworteten Fragen nicht mehr als 18 vom Hundert unter der durchschnittlichen Prüfungsleistung der Prüflinge des jeweiligen Prüfungstermins im gesamten Bundesgebiet liegt oder wenn der Prüfling mindestens 50 vom Hundert der Fragen zutreffend beantwortet hat.

6. Das Ergebnis der Prüfung wird durch das Landesprüfungsamt festgestellt und dem Prüfling unverzüglich mitgeteilt. Dabei ist die Zahl der vom Prüfling zutreffend beantworteten Fragen sowie die durchschnittliche Prüfungsleistung in dem betreffenden Prüfungstermin anzugeben.

§ 15

Mündliche Prüfung im Dritten Abschnitt der Ärztlichen Prüfung

1. Der mündliche Teil im Dritten Abschnitt der Ärztlichen Prüfung wird von einer Prüfungskommission abgelegt. Die Prüfungskommissionen werden vom Landesprüfungsamt bestellt. Sie bestehen jeweils aus dem Vorsitzenden und mindestens zwei, höchstens vier weiteren Mitgliedern. Ausser Hochschullehrern der Medizin können auch Ärzte, die nicht dem Lehrkörper einer Hochschule angehören, zu Mitgliedern bestellt werden.

2. Der Vorsitzende der Prüfungskommission leitet die Prüfung und ist selbst Prüfer. Er hat darauf zu achten, dass die Prüflinge in geeigneter Weise befragt werden. Ihm obliegt die Aufrechterhaltung der Ordnung.

3. Die Prüfungskommission hat während der gesamten Prüfung anwesend zu sein.

4. In einem Termin dürfen nicht mehr als vier Prüflinge geprüft werden.

5. Für den Inhalt der mündlichen Prüfung und ihre Dauer gilt § 33.

6. Die zuständige Behörde kann zum mündlichen Termin Beobachter entsenden. Der Vorsitzende der Prüfungskommission hat jeweils bis zu fünf bereits zur gleichen Prüfung zugelassenen Studierenden der Medizin einem Mitglied des Lehrkörpers einer Hochschule des Landes und einem Vertreter der zuständigen Ärztekammer zu gestatten, bei der Prüfung, die Bekanntgabe des Prüfungsergebnisses ausgenommen, anwesend zu sein. Dabei hat er auf eine gleichmässige Berücksichtigung der Studierenden zu achten.

7. Über die Folgen von Ordnungsverstössen und Täuschungsversuchen entscheidet das Landesprüfungsamt, § 14 Abs. 4 gilt entsprechend.

8. Die mündliche Prüfung ist bestanden, wenn der Prüfling ausreichende Leistungen gezeigt hat.

9. Über den Verlauf der Prüfung jedes Prüflings ist eine von allen Mitgliedern der Prüfungskommission zu unterzeichnende Niederschrift nach dem Muster der Anlage 8 zu dieser Verordnung anzufertigen, aus der der Gegenstand der Prüfung, das Prüfungsergebnis sowie etwa vorkommende schwere Unregelmässigkeiten ersichtlich sind.

10. Die Prüfungskommission trifft ihre Entscheidungen mit Stimmenmehrheit. Bei Stimmengleichheit gibt die Stimme des Vorsitzenden den Ausschlag. Der Vorsitzende teilt den Prüflingen mit, ob die mündliche Prüfung bestanden ist. Das Landesprüfungsamt teilt dem Prüfling das Ergebnis schriftlich mit. Ist die Prüfung nicht bestanden, sind die Gründe anzugeben.

§ 16

Prüfungstermine

1. Die nach dieser Verordnung vorgesehenen Prüfungen werden jeweils im März und August durchgeführt. Die Prüfungen im Dritten Abschnitt der Ärztlichen Prüfung finden jeweils im April und Oktober statt.

2. Wiederholungen der schriftlichen Prüfung werden im Rahmen der in Absatz 1 genannten Prüfungstermine durchgeführt. Für Wiederholungen des mündlichen Teils des Dritten Abschnitts der Ärztlichen Prüfung sind Prüfungstermine auch ausserhalb der in Absatz 1 genannten Prüfungszeiten durchzuführen.

§ 17

Ladung zum Prüfungstermin

Der Prüfling wird spätestens sieben Tage vor dem Prüfungstermin gegen Empfangsbekenntnis geraden.

§ 18

Rücktritt von der Prüfung

1. Tritt ein Prüfling nach seiner Zulassung von einer Prüfung oder einem Prüfungsabschnitt zurück, so hat er die Gründe für seinen Rücktritt unverzüglich dem Landesprüfungsamt mitzuteilen. Genehmigt das Landesprüfungsamt den Rücktritt, so gilt die Prüfung oder der Prüfungsabschnitt als nicht unternommen. Die Genehmigung ist nur zu erteilen, wenn wichtige Gründe vorliegen. Im Falle einer Krankheit kann das Landesprüfungsamt die Vorlage einer ärztlichen oder amtsärztlichen Bescheinigung verlangen.

2. Wird die Genehmigung für den Rücktritt nicht erteilt oder unterlässt es der Prüfling, die Gründe für seinen Rücktritt unverzüglich mitzuteilen, so gilt die Prüfung oder Prüfungsabschnitt als nicht bestanden.

§ 19

Versäumnisfolgen

1. Versäumt ein Prüfling einen Prüfungstermin oder gibt er die Aufsichtsarbeit nicht oder nicht rechtzeitig ab oder unterbricht er die Prüfung, so gilt die Prüfung, der Prüfungsabschnitt oder im Dritten Abschnitt der Ärztlichen Prüfung der betreffende Prüfungsteil als nicht bestanden, wenn nicht ein wichtiger Grund vorliegt. Liegt ein wichtiger Grund vor, so gilt die Prüfung, der Prüfungsabschnitt oder der Teil der Prüfung als nicht unternommen.

2. Die Entscheidung darüber, ob ein wichtiger Grund vorliegt, trifft das Landesprüfungsamt, § 18 Abs. 1 Satz 1 und 4 gilt entsprechend.

§ 20

Wiederholung von Prüfungen

1. Jede Prüfung und jeder Prüfungsabschnitt kann im ganzen oder, im Falle des Dritten Abschnitts der Ärztlichen Prüfung, in den einzelnen Teilen insgesamt zweimal wiederholt werden. Eine weitere Wiederholung ist auch nach erneutem Studium der Medizin nicht möglich.

2. Der Prüfung soll sich möglichst zu den Wiederholungsprüfungen zum nächsten Prüfungstermin melden. Zu einer Wiederholungsprüfung eines Teils des Dritten Abschnitts der Ärztlichen Prüfung wird der Prüfung von Amts wegen geladen. Zur Wiederholung des schriftlichen Teils soll der Prüfling zu dem nächsten Prüfungstermin, zur Wiederholung des mündlichen Teils zu einem Termin innerhalb von sechs Monaten nach dem Zeitpunkt der erfolglos abgelegten Prüfung geladen werden. Zusätzlich Ausbildungsnachweise (§ 21 Abs. 2) sind dem Landesprüfungsamt vom Studierenden unverzüglich nach Erhalt zuzuleiten.

§ 21

Prüfungszeugnis und Mitteilungen

1. Der Prüfling, der die Prüfung oder den Prüfungsabschnitt bestanden hat, erhält vom Landesprüfungsamt ein Zeugnis nach Massgabe der besonderen Prüfungsbestimmungen.

2. Ist der Dritte Abschnitt der Ärztlichen Prüfung oder ein Teil dieses Prüfungsabschnitts nicht bestanden, entscheidet das Landesprüfungsamt unverzüglich, ob und wie lange der Prüfling erneut an einer Ausbildung nach § 3 teilzunehmen hat. Dem Prüfling ist die Entscheidung rechtzeitig mitzuteilen. Die Zeit der Teilnahme kann mindestens zwei, höchstens vier Monate betragen.

3. Das Landesprüfungsamt unterrichtet den Prüfling und die anderen Landesprüfungsämter schriftlich, wenn eine Prüfung endgültig nicht bestanden worden ist und nicht mehr wiederholt werden kann. Die Mitteilung an den Prüfling hat den Hinweis zu enthalten, dass er auch nach einem erneuten Studium der Medizin zu der Prüfung nicht mehr zugelassen werden kann. Den erfolgreichen Abschluss der Ärztlichen Prüfung hat das Landesprüfungsamt der zuständigen Landesbehörde mitzuteilen.

Dritter Abschnitt

Die Ärztliche Vorprüfung

§ 22

Inhalt der Prüfung

Die Ärztliche Vorprüfung betrifft folgende Stoffgebiete :

I. Physik für Mediziner und Physiologie,

II. Chemie für Mediziner und Physiologische Chemie,

III. Biologie für Mediziner und Anatomie,

IV. Medizinische Psychologie und Medizinische Soziologie.

§ 23

Schriftliche Aufsichtsarbeit

1. Die Prüfung findet an zwei aufeinanderfolgenden Tagen statt. Die Prüfung dauert am ersten Prüfungstag vier, am zweiten dreieinhalb Stunden. Auf den ersten Prüfungstag entfallen die Stoffgebiete I und II, auf den zweiten die Stoffgebiete III und IV.

2. Die Anzahl der in der Aufsichtsarbeit zu bearbeitenden Fragen und Ihre Verteilung auf die einzelnen Stoffgebiete ergeben sich aus der Anlage 9 zu dieser Verordnung. Die Fragen müssen auf den in der Anlage 10 zu dieser Verordnung festgelegten Prüfungsstoff abgestellt sein.

§ 24

Zeugnis

Über das Bestehen der Ärztlichen Vorprüfung wird ein Zeugnis nach dem Muster der Analge 11 erteilt.

Vierter Abschnitt

Die Ärztliche Prüfung

Erster Unterabschnitt

Erster Abschnitt der Ärztlichen Prüfung

§ 25

Inhalt der Prüfung

Der Erste Abschnitt der Ärztlichen Prüfung betrifft folgende Stoffgebiete :

I. Allgemeine Krankheitslehre,

II. Grundlagen der Klinischen Medizin.

§ 26

Schriftliche Aufsichtsarbeit

1. Die Prüfung findet an zwei aufeinanderfolgenden Tagen statt. Die Prüfung dauert an beiden Tagen je drei Stunden. Auf den ersten Prüfungstag entfällt das Stoffgebiet I, auf den z weiten das Stoffgebiet II;

2. Die Anzahl der in der Aufsichtsarbeit zu bearbeitenden Fragen und ihre Verteilung auf die einzelnen Stoffgebiete ergeben sich aus der Anlage 12 zu dieser Verordnung. Die Fragen müssen auf den in der Anlage 13 zu dieser Verordnung festgelegten Prüfungsstoff abgestellt sein.

§ 27

Zeugnis

Über das Bestehen des Ersten Abschnitts der Ärztlichen Prüfung wird ein Zeugnis nach dem Muster der Anlage 14 erteilt.

Zweiter Unterabschnitt

Zweiter Abschnitt der Ärztlichen Prüfung

§ 28

Inhalt der Prüfung

Der Zweite Abschnitt der Ärztlichen Prüfung betrifft folgende Stoffgebieten :

I. Nichtoperatives Stoffgebiet,

II. Operatives Stoffgebiet,

III. Nervenheilkundliches Stoffgebiet,

IV. Ökologisches Stoffgebiet.

§ 29

Schriftliche Aufsichtsarbeit

1. Die Prüfung findet an vier aufeinanderfolgenden Tagen statt. Die Prüfung dauert an den beiden ersten Tagen je dreidreiviertel, an den beiden letzten Tagen je zweieinhalb Stunden. Die Stoffgebiete verteilen sich auf die Prüfungstage in der Reihenfolge ihrer Aufzählung in § 28.

2. Die Anzahl der in der Aufsichtsarbeit zu bearbeitenden Fragen und ihre Verteilung auf die einzelnen Stoffgebiete ergeben sich aus der Anlage 15 zu dieser Verordnung. Die Fragen müssen auf den in der Anlage 16 zu dieser Verordnung festgelegten Prüfungsstoff abgestellt sein.

§ 30

Zeugnis

Über das Bestehen des Zweiten Abschnitts der Ärztlichen Prüfung wird ein Zeugnis nach dem Muster der Anlage 17 erteilt.

Dritter Unterabschnitt

Dritter Abschnitt der Ärztlichen Prüfung

§ 31

Inhalt des schriftlichen Teils der Prüfung

Der schriftliche Teil des Dritten Abschnitts der Ärztlichen Prüfung betrifft folgende Stoffgebiete :

I. Innere Medizin,

II. Chirurgie.

§ 32

Schriftliche Aufsichtsarbeit

1. Die Prüfung findet an zwei aufeinanderfolgenden Tagen statt. Die Prüfung dauert am ersten Tag dreieinhalb, am zweiten Tag zweieinhalb Stunden. Die Stoffgebiete verteilen sich auf die Prüfungstage in der Reihenfolge ihrer Aufzählung in § 31.

2. Die Anzahl der in der Aufsichtsarbeit zu bearbeitenden Fragen und ihre Verteilung auf die Stoffgebiete ergeben sich aus der Anlage 18 zu dieser Verordnung. Die Fragen müssen auf den in der Anlage 19 zu dieser Verordnung festgelegten Prüfungsstoff abgestellt sein.

§ 33

Mündlicher Teil der Prüfung

1. Der mündliche Teil der Prüfung dauert bei vier Prüflingen etwa drei Stunden. Dem Prüfling sind praktische Aufgaben aus den klinisch-praktischen Fachgebieten (§ 3 Abs. 1) zu stellen. Die Prüfung hat sich in jedem Fall auf das Gebiet zu erstrecken, auf dem der Prüfling seine praktische Ausbildung nach § 3 Abs. 1 Satz 2 Nr. 3 erfahren hat.

2. In der Prüfung hat der Prüfling am Patienten zu zeigen. dass er die während des Studiums erworbenen Kenntnisse in der Praxis anzuwenden weiss und über die für den Arzt erforderlichen methodischen Grundkenntnisse und Fertigkeiten verfügt. Er hat insbesondere nachzuweisen, dass er

1. die Technik der Anamneseerhebung der einfachen klinischen Untersuchungsmethoden und die Technik der einfachen Laboratoriumsmethoden beherrscht, und dass er ihre Resultate beurteilen kann ;
2. in der Lage ist, kompliziertere Informationen, die zur Diagnosestellung erforderlich sind, anzufordern und im Rahmen differentialdiagnostischer Überlegungen kritisch zu verwerten ;
3. die Indikation zu konservativer und operativer Therapie sowie die wichtigsten therapeutsichen Prinzipien - insbesondere die Arzneimitteltherapie - beherrscht und
4. die allgemeinen Regeln ärztlichen Verhaltens gegenüber dem Patienten kennt und sich der Situation entsprechend verhält.

§ 34

Zeugnis

Über das Bestehen der Ärztlichen Prüfung wird ein Zeugnis nach dem Muster der Anlage 20 erteilt.

Fünfter Abschnitt

Die Approbation

§ 35

Antrag auf Approbation

1. Der Antrag auf die Approbation als Arzt ist an die zuständige Behörde des Landes zu richten, in dem der Antragsteller den Dritten Abschnitt der Ärztlichen Prüfung bestanden hat. Dem Antrag sind beizufügen :

1. ein kurzgefasster Lebenslauf,
2. die Geburtsurkunde,
3. ein Nachweis über die Staatsangehörigkeit des Antragstellers,
4. ein amtliches Führungszeugnis, das nicht früher als einen Monat vor der Vorlage ausgestellt sein darf,
5. eine Erklärung darüber, ob gegen den Antragsteller ein gerichtliches Strafverfahren oder ein staatsanwaltschaftliches Ermittlungsverfahren anhängig ist,

6. eine ärztliche Bescheinigung, die nicht früher als einen Monat vor der Vorlage ausgestellt sein darf, wonach keine Anhaltspunkte dafür vorliegen, dass der Antra-steller wegen eines körperlichen Gebrechens oder wegen Schwäche seiner geistigen oder körperlichen Kräfte oder wegen einer Sucht zu Ausübung des ärztlichen Berufs unfähig oder ungeeignet ist und

7. das Zeugnis über die Ärztliche Prüfung.

2. Soll eine Approbation nach § 3 Abs. 1 Satz 2, Abs. 2 oder 3 der Bundesärzteordnung erteilt werden, so sind, sofern die Ausbildung nicht nach den Vorschriften dieser Verordnung erfolgt ist, an Stelle des Zeugnisses nach Absatz 1 Nr 7 Unterlagen über die abgeschlossene ärztliche Ausbildung des Antragstellers in Urschrift, in beglaubigter Abschrift oder beglaubigter Ablichtung und, soweit die Nachweise nicht in deutscher Sprache ausgestellt sind, zusätzlich in beglaubigter Übersetzung vorzulegen. Die zuständige Behörde kann die Vorlage weiterer Nachweise, insbesondere über eine bisherige berufliche Tätigkeit, verlangen.

§ 36

Approbationsurkunde

Die Approbationsurkunde wird nach dem Muster den Anlage 21 zu dieser Verordnung ausgestellt. Sie ist dem Antragsteller gegen Empfangsbekenntnis auszuändigen oder mit Zustellungsurkunde zuzustellen.

Sechster Abschnitt

Übergangsbestimmungen

§ 37

Anwendung der Bestallungsordnung für Ärzte

Die Bestallungsordnung für Ärzte vom 15. September 1953 (Bundesgesetzblatt I S. 1334), zuletzt geändert durch die Verordnung über die Neugliederung der Medizinalassistentenzeit und über die Approbationsurkunde vom 24. Februar 1970 (Bundesgesetzblatt I S. 214) findet, soweit in den nachfolgenden Vorschriften nichts Abweichendes bestimmt ist, Anwendung für :

1. Studierende, die sich am 1. Januar 1970 im vorklinischen Studium befanden :

2. Studierende, die im Jahre 1970 das Medizinstudium begonnen haben oder beginnen ;

3. Studierende, die im Sommersemester 1971 das Medizinstudium beginnen und

4. Studierende, die im Wintersemester 1971/1972 oder im Sommersemester 1972 das Medizinstudium beginnen.

§ 38

Abweichende Regelungen für die Ausbildung

1. Für Studierende nach § 37 Nr. 1 dauert die Vorbereitungszeit als Medizinalassistent ein Jahr. Davon sind mindestens je vier Monate auf einer Abteilung für innere Krankheiten und auf einer chirurgischen Abteilung zu verbringen. Für die übrigen in § 37 genannten Studierenden entfällt diese Vorbereitungszeit.

2. Die Ausbildung der Studierenden nach § 37 Nr. 2 bis 4 umfasst ein Hochschulstudium der Medizin von mindestens sechs Jahren sowie einen Krankenpflegedienst und eine Famulatur von je zwei Monaten. Für Studierende nach § 37 Nr. 2 dauert der vorklinische Teil des Hochschulstudiums mindestens zweieinahlb, der klinische Teil mindestens dreieinhalb Jahre. Für Studierende nach § 37 Nr. 3 und 4 dauert der vorklinische Teil des Hochschulstudiums mindestens zwei, der klinische Teil mindestens vier Jahre.

3. Bei Studierenden nach § 37 Nr. 2 entfallen die letzten acht Monate des klinischen Studiums auf eine Zusammenhängende praktische Ausbildung in Krankenanstellen, die sich in eine je viermonatige Ausbildung auf den Gebieten der Inneren Medizin und der Chirurgie aufgliedert. Für Studierende nach § 37 Nr. 3 verlängert sich die praktische Ausbildung auf ein Jahr, wobei je vier Monate auf eine Ausbildung auf den Gebieten der Inneren Medizin, der Chirurgie und einem der in § 44 Abs. 1 unter VII bis XII der Bestallungsordnung für Ärzte genannten Gebiete entfallen. § 3 Abs. 2 bis 4 und § 4 dieser Verordnung finden entsprechende Anwendung.

4. Studierende nach § 37 Nr. 4 setzen nach Bestehen der ärztlichen Vorprüfung die ärztliche Ausbildung nach den Vorschriften dieser Verordnung fort.

§ 39

Abweichende Regelungen für die Prüfungen

1. In den Prüfungen können in jedem Prüfungsfach auch Aufgaben zu schriftlichen Bearbeitung gestellt werden.

2. Der in § 13 Abs. 3 der Bestallungsordnung für Ärzte geforderte Nachweis einer Leistungsnote in Latein oder über das sogenannte Kleine Latinum kann ersetzt werden durch den Nachweis über die regelmässige und erfolgreiche Teilnahme an einem von der Hochschule durchgeführten Kursus über medizinische Terminologie.

3. Bei der Meldung zur naturwissenschaftlichen Vorprüfung tritt bei Studierenden nach § 37 Nr. 2 bis 4 an die Stelle des in § 22 Abs. 2 der Bestallungsordnung für Ärzte vorgesehenen Nachweises der Nachweis, dass der Studierende nach Erlangung des Reifezeugnisses mindestens ein Jahr an deutschen Hochschulen ordnungsgemäss Medizin studiert hat.

4. Bei der Meldung zur ärztlichen Vorprüfung treten :

1. bei Studierenden nach § 37 Nr. 2 an die Stelle des in § 31 Abs. 2 Satz 1 der Bestallungsordnung für Ärzte vorgesehenen Nachweises der Nachweis, dass der Studierende die naturwissenschaftliche Vorprüfung vollständig bestanden und nach Erlangung des Reifezeugnisses mindestens zweieinhalb Jahre an deutschen Hochschulen ordnungsgemäss Medizin studiert hat ;

2. bei Studierenden nach § 37 Nr. 3 und 4

   a. an die Stelle des in § 31 Abs. 2 Satz 1 der Bestallungsordnung für Ärzte vorgesehenen Nachweises der Nachweis, dass der Studierende die naturwissenschaftliche Vorprüfung vollständig bestanden und nach Erlangung des Reifezeugnisses mindestens zwei Jahre an deutschen Hochschulen ordnungsgemäss Medizin studiert hat,

   b. an die Stelle der in § 31 Abs. 4 Buchstabe a. der Bestallungsordnung für Ärzte vorgesehenen dreisemestrigen eine zweisemestrige Vorlesung über Anatomie und

   c. an die Stelle der in § 31 Abs. 4 Buchstabe b. der Bestallungsordnung für Ärzte vorgesehenen zweisemestrigen eine einsemestrige anatomische Präparierübung.

5. Bei der Meldung zur ärztlichen Prüfung haben Studierende nach § 37 Nr. 1 bis 3 den der Meldung nach § 40 der Bestallungsordnung für Ärzte beizufügenden Nachweisen zusätzlich beizufügen eine Bescheinigung nach dem Muster der Anlage 6 der Bestallungsordnung für Ärzte über die regelmässige und erfolgreiche Teilnahme an einem radiologischen Kursus unter besonderer Berücksichtigung des Strahlenschutzes. Studierende nach § 37 Nr. 2 und 3 haben ausserdem eine Bescheinigung nach dem Muster der Anlage 22 zu dieser Verordnung über die regelmässige Teilnahme an einer praktischen Ausbildung in Krankenanstalten nach § 38 Abs. 3 beizufügen.

Ausserdem tritt

1. bei Studierenden nach § 37 Nr. 2 an die Stelle der in § 39 Abs. 1 und 2 der Bestallungsordnung für Ärzte vorgesehenen Nachweise der Nachweis, dass der Kandidat nach Erlangung des Reifezeugnisses mindestens sechs Jahre an deutschen Hochschulen ordnungsgemäss Medizin studiert hat, wobei von der nachzuweisenden Studienzeit mindestens dreieinhalb Jahre auf die Studienzeit mindestens dreieinhalb Jahre auf die Studienzeit nach vollständig bestandener ärztlicher Vorprüfung entfallen müssen ;

2. bei Studierenden nach § 37 Nr. 3 an die Stelle der in § 39 Abs. 1 und 2 der Bestallungsordnung für Ärzte vorgesehenen Nachweise der Nachweis, dass der Kandidat nach Erlangung des Reifezeugnisses mindestens sechs Jahre an deutschen Hochschulen ordnungsgemäss Medizin studiert hat, wobei von der nachzuweisenden Studienzeit mindestens vier Jahre auf die Studienzeit nach vollständig bestandener Prüfung entfallen müssen.

6. An Stelle der in § 62 Abs. 3 Satz 2 der Bestallungsordnung für Ärzte vorgesehenen Urkunde erhalten Studierende nach § 37 Nr. 2 und 3 eine Urkunde nach dem Muster der Anlage 23 zu dieser Verordnung.

§ 40

Abweichende Regelungen für die Approbation

1. Bei Studierenden nach § 37 Nr. 1 wird die Approbationsurkunde nach dem Muster der Anlage zu der Verordnung über die Neugliederung der Medizinalassistentenzeit und über die Approbationsurkunde vom 24. Februar 1970 (Bundesgesetzblatt I, S. 214) ausgestellt.

2. Bei Studierenden nach § 37 Nr. 2 und 3 gelten für die Approbation als Arzt § 35 Abs. 1 und § 36 dieser Verordnung mit der Massgabe, dass der Antrag an die zuständige Behörde des Landes zu richten ist, in dem der Kandidat die ärztliche Prüfung bestanden hat.

Siebenter Abschnitt

Schlussbestimmungen

§ 41

Geltung im Lande Berlin

Diese Verordnung gilt nach § 14 des Dritten Überleitungsgesetzes vom 4. Januar 1952 (Bundesgesetzblatt I S. 1) in Verbindung mit § 15 der Bundesärzteordnung in der Fassung der Bekanntmachung vom 4. Februar 1970 (Bundesgesetzblatt I S. 237) und Artikel 4 des Gesetzes zur Änderung der Bundesärzteordnung vom 28. August 1969 (Bundesgesetzblatt I S. 1509) auch im Land Berlin.

§ 42

Inkrafttreten der Verordnung
und ausserkrafttretende Vorschriften

1. Es treten in Kraft :

1. der Erste bis Vierte Abschnitt am 1. Oktober 1972 ;

2. die übrigen Vorschriften am Tage nach der Verkündung.

2. Mit dem in Absatz 1 Nr. 1 genannten Zeitpunkt tritt vorbehaltlich der Regelungen in Artikel 2 des Gesetzes zur Änderung der Bundesärzteordnung vom 28. August 1969 (Bundesgesetzblatt I S. 1509) und den Vorschriften des Sechsten Abschnitts dieser Verordnung die Bestallungsordnung für Ärzte vom 15. September 1953 (Bundesgesetzblatt I S. 1334), zuletzt geändert durch die Verordnung über die Neugliederung der Medizinalassistentenzeit und über die Approbationsurkunde vom 24. Februar 1970 (Bundesgesetzblatt I S. 214), ausser Kraft.

3. Die Verordnung über die Gebühren für die naturwissenschaftliche Vorprüfung, die ärztliche Vorprüfung und die ärztliche Prüfung vom 26. Juni 1958 (Bundesgesetzblatt Nr. 123/1958) tritt am 1. Januar 1971 ausser Kraft.

Bonn, den 28. Oktober 1970

Der Bundesminister

für Jugend, Familie und Gesundheit
Käte Strobel

C H A P T E R I I

FRANCE

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1. INTRODUCTION

The reorganisation of medical teaching has been among the aims of the French governments for some 15 years.

An important function has been performed by the "Interministerial Committee to study the problems of medical teaching, the hospital system and social and health activities", set up by an Order in Council of 18 September 1956, whose chairman and leading light was Professor Robert Debré. This committee was the source of a number of orders and regulations on which the embryonic "Debré Reforms" are founded.

Since the political upheaval in France in May and June 1968, universities as a whole have been the subject of intense activity on the part of the government. In this process different pressure groups have attempted to influence the government over the past 2 years with varying degrees of success.

As we shall see, a number of more or less related proposals for structural reform have been put forward from various sides, including:

- the Ministry of National Education,
- the Ministry of Health,
- professional bodies,
- student bodies etc ...

None of the decisions taken has achieved anything but very partial results. Until quite recently, no methodical study of the scope of the reforms had been conducted, except in the form of analyses based on arguable premises or seen from the standpoint of only one sector of the profession and these were immediately challenged by the others.

Since 1969, an honest attempt has been made to assess the actual situation; but it has been undertaken with greatly inadequate resources and it was based on a method which as yet is very uncertain.

2. THE PRESENT SYSTEM

2.1 The system in theory. Medical students enter university at the end of their secondary education, on the strength of their baccalauréat (school-leaving certificate). Most of them are between 18 and 20 years of age when they enrol for the first year of part one ("1er cycle") of the medical course (PCEM), see Table 1.

Entry is not at present subject to an entrance examination or numerus clausus. In theory, studies cover a period of 7 years, including one year's preparatory study which was called PCB (physics, chemistry, biology) until 1962-63, CPEM (preparatory certificate for medical studies) from 1963-64 to 1967-68, and which since 1968-69 has been called the first year of the PCEM. The next 5 years' study are spent in hospital and university centres (CHU). During their last year, or "student intern" year, the students work as resident assistants

in an approved hospital. They may then present their thesis and receive their doctorate.

Table 1 - Age of first-year students on 1 January 1966

Age	Men	Women
18 years	14%	25%
19 years	30%	33%
20 years	24%	20%
21 years	19%	13%
22 years and over	13%	9%

2.2 The actual situation in recent times. In fact, the course lasts much longer. A study conducted in 1962 on the time taken by a class in Paris between enrolment for the first year, ie at the end of the preparatory year, and the date of the thesis (6 years, in theory) showed that the length of the course averaged between 8.8 and 12.7 years, according to the category (Table 2).

Table 2 - Duration of medical studies

Category	Men	Women
Students not working as hospital assistants	9 years	8.8 years
Non-resident hospital assistants	10.1 years	10.1 years
Resident hospital assistants	12.7 years	11.6 years

Table 3 - Average age on presentation of the thesis

Paris	28.6 years
Lyon	27.9 years
North (except Paris)	27.9 years
South (except Lyon)	27.6 years

2.3 End-of-year examinations. At the end of each study year or at the end of the course on a particular subject, students must take an examination before going on to the next year. These end-of-year examinations are organised by the different faculties and take a variety of forms - written, oral, multiple-choice questions etc. In some cases, success at the end of the year depends on the total marks obtained in each test, where the total must be equal to, or higher than, average; in other cases, an average mark must be obtained in each test. If a student's mark is lower than average, he can normally take the test a second time. If he fails at the second sitting, he loses the benefit of that year's study and is required to repeat the whole academic year.

The present study concentrates on 2 aspects:

- the increasing length of studies;

- the examination system.

These have been chosen as representing the contradictions of a system in which every component part, except the control machinery, has changed. The effects hereof on the supply of medical manpower and its cost may be better appreciated after perusal of Table 4. This table shows fate of an imaginary class of 1,000 students entering for the CPEM, and subject to the 1967 examination. It may be seen that, if no years were repeated, less than a third of the students would complete their studies.

Table 4 - Success rate of an imaginary class of 1,000 students

New nomenclature	Old nomenclature	Number of students	Success rate
Part 1 (PCEM)	1. preparatory year	1,000	63.1%
	2. 1st year	631	75.8%
Part 2 (DCEM)	1. 2nd year	478	87.8%
	2. 3rd year	420	92.5%
	3. 4th year	388	84.2%
	4. 5th year	327	92.5%
Part 3 (TCEM)	1. 6th year	303	

It should be pointed out straightaway that students frequently do repeat years, and that far fewer are therefore eliminated than is indicated above, but:

a. the real situation is not known or regularly checked, for lack of suitable long-term studies;

b. drop-outs unconnected with examination failures are not uncommon, but there is no check on their number or characteristics.

2.4 Traits and effects of the present system. An outline of some of the characteristics of medical education in France may help to explain the current options and plans:

1. Except in the preparatory year, no teacher who is not a doctor can be involved as a professor or head of a department in the training of doctors. Until the "Loi d'Orientation Universitaire" (University Programmes Act) began to be applied, there was total separation, and a climate of distrust, between the faculties of medicine and the rest of the university.

2. It was an accepted fact within the medical faculties that each chair or department was free to organise its teaching as it thought fit. Subject to compliance with a few formal regulations laid down by the Ministry of National Education regarding the spacing and frequency of examinations, allocation of subjects, timetables, the resources allocated to each of them etc.

3. The complete absence of any training in educational sciences, contrasted with

4. the excessive importance attached to competitive examinations in hospitals in university towns, and unofficial coaching in preparation for them.

These competitive examinations, which are quite separate from the university system, involve tests of memory and formal presentation. Success in them brings the student such advantages as exclusive entry to academic careers

in medicine, considerable head-start in obtaining certain specialist qualifications.

5. To date, specialist training has followed 2 different courses:

   - an intern course, generally providing a quite adequate clinical training (though sometimes wrongly over-valued);

   - courses leading up to special study certificates (CES), involving theoretical training but not necessarily clinical practice.

6. Until the beginning of the sixties, proper medical research was an exception in faculties of medicine and hospitals (we shall take, as a rough criterion of the quality of research, its reputation inside its special field, and the extent to which it is known internationally and through publications).

   The research centres such as the Institut Pasteur, the CNRS (National Scientific Research Centre) laboratory and some faculties of science, have no institutional relations with the medical world.

   This situation has changed somewhat over the last 10 years or so, since the creation of the National Institute of Health and Medical Research (INSERM) and its establishment in a hospital and university environment, together with the CNRS and other smaller bodies. Generally speaking, however, this has not helped to bring research workers and teachers closer together. The same establishments often accommodate teachers who have little opportunity for research, for lack of time and adequate training, and sometimes for lack of facilities (though less often than is said), together with full-time research workers who are jealous of their freedom and are reluctant on the whole to play any regular part in teaching, however small.

7. In hospital circles too, despite the pressure of international publications and the introduction of full-time clinical employment, worthwhile clinical research work is a rarity.

   This brings us to the following facts:

   - Unlike what happens in other countries, the efforts of young teachers to do original research is not favourably reflected in the progress of their hospital and university careers.

   - Study periods of one year or more spent abroad by recently qualified doctors are negligible in number.

   - The proportion of medical students attending part-time courses in research laboratories during their final year is extremely small - much smaller than the numbers attending scientific courses in the hope of acquiring an additional diploma. It is as though research and medical teaching were completely unconnected fields.

   - Accordingly, it is very rare indeed for young medical students to attend laboratory courses in biology or behavioural sciences; the very idea that this might be possible and desirable seems not to have occurred either to teachers or to students, and rarely to research workers.

2.5 Emergence of new ideas. For want of a proper assessment of the situation and an overall view of the facts of medical teaching, official bodies at present have no clear or original ideas on the aims and objectives of medical teaching. This does not mean that there are no ideas; on the contrary, there are plenty, but they are contradictory and very varied in origin.

However, under the pressure of events, all the pressure groups have included medical education in what they consider should be the country's health policy.

For example, a national committee (Conseil National de l'Ordre des Médecins) in March 1970 emphasised:

- the scientific and moral demands of medicine;

- the scientific discipline of medicine;

- the increasing tendency to turn away from general medicine, a serious danger which must be averted without delay;

- the need for permanent training.

The Minister for National Education, M O Guichard, for his part, stressed, in April 1970, the following:

- The doctors who are now being trained will still be practising in 2010 or 2020. In order to keep continually abreast of developments during this period, what doctors will need above all is a framework of basic knowledge, a critical mind, and a scientific approach, since these alone will enable them to keep up with the wealth of new discoveries and avoid feeling left behind. Besides the acquisition of knowledge, therefore, primary attention must be given to the training of the intellect.

- The teaching of basic sciences must take place at a high level. ".... it provides the student with an intellectual method, a certain familiarity with scientific reasoning; it develops the ability to observe and to relate ...".

- The aim of the human biology course must be to train "that elite of young medical researchers needed by the country as particularly those who will subsequently work in university hospitals, to come in contact with a living science, a growing science, and to benefit from the stern intellectual training which participation in research work means".

In June 1968, the medical students proposed in their "White Book on Reform" that, in the first instance, students should learn how to learn, so as to be prepared for the acquisition of the "encyclopaedic" and practical knowledge they will need during the second stage of their training. This second stage would be devoted to the acquisition of knowledge as the term is currently understood and to gradual integration into the professional environment.

The students also proposed the following objectives:

- understanding and assimilation of the mechanisms and thought processes which lead to detailed knowledge;

- active participation through self-tuition;

- continuous guidance on careers and on the means of transition between medical studies and paramedical studies;

- training in team-work;

- training in responsibility through participation in all university decisions.

As will be seen, a number of points are common to these 3 groups of objectives; clearly, however, none of these declarations tackles the problem in terms of practical action. They remain on a level where it is comparatively easy to obtain a consensus but, because of their vagueness, are of little help in giving effect to the intentions expressed.

In an information note of November 1969, the Society for Information and Research on Medical Education (SIREM) reported on a survey conducted in 1968

which revealed that the objectives, as perceived by teachers, students and practising doctors, were a matter of considerable confusion. The document suggested a way in which the problem might be tackled.

The most that can be hoped is that, in a few years' time, there will be an increase in the number of people in positions of responsibility, who are aware of the nature of the problem.

3. THE AIMS OF THE REFORMS

The explanatory report on the Debré reforms of 1958 mentioned the need to catch up on the scientific backlog facing French medicine. The means suggested to attain this very general objective were basically structural and administrative.

The first step seemed to be to establish a full-time role for all doctors engaged in hospital and university work, the intention being to enable these full-time doctors to fulfil several complementary functions - teaching, clinical practice and research - on the understanding that the public hospitals were to open consultation services and private wards to which these doctors might devote a limited part of their time. The general idea underlying the reform was to assign qualified staff to one place of work, to make their work more effective and associate it with fields of activity hitherto inaccessible to them. Ten years or so later, the operation may be said to have had some success in this respect. On the other hand, an attempt made at the same time to eliminate the two-fold aspect to the doctors' training - preparation for faculty examinations and for competitive hospital examinations - failed for a variety of reasons among them the fact that the buildings and facilities needed to accommodate the medical students in a single place of work were not built, and because, both in the provinces and in Paris, continued use of the same premises meant that the same habits persisted.

The situation has now changed and a number of university hospital centres have at least been opened during the last 4 or 5 years. In a recent report on the organisation of medical studies (May 1970), the essential aims proposed are as follows:

1. Medical training to be divided into 3 parts of different lengths.

2. Part 1 to have a dual purpose:

   - to provide future doctors with the scientific training they need;

   - to include a number of options in the training course so as to enable students prevented from continuing their medical studies beyond this first part to enter another field.

   Regional circumstances permitting, this first part, besides comprising medical studies, could prepare students either for short training courses or for long training courses such as pharmaceutical and scientific studies. The educational objective at this stage is the acquisition of general knowledge and skills, there being no question of influencing the students' attitudes.

3. The purpose of Part 2 is explained as follows:

   "Any educational reform must aim to provide high-grade training, both for general practitioners and for specialists".

   "Improved training for the general practitioner involves:

   - allocation of hospital duties to all Part 2 students;

   - improved theoretical instruction during Part 2;

- preparation for medical practice through contacts with medicine outside the hospital system."

4. The aims of Part 3 are related to the numerical hypothesis that approximately 30% of medical graduates will train as specialists. Better information should be available at this point in order to encourage recruiting to the ranks of the general practitioners, and this might result in:

"- the provision during Part 3 of a course intended for future practitioners;

- post-university education amounting to genuine recycle retraining".

There are plans to increase the number of medical biologists by giving urgent priority to the institution of a human biology course.

As will be seen, the aims set out above remain on a very general level, and the criteria on which they depend are essentially quantitative ones, based on figures supplied by certain organisations which have been studying the economics and statistics of the medical services, for a number of years. The importance attached to these data, which have been considered almost to the exclusion of everything else and certainly of any educational considerations, is probably due in part to the fascination exerted by something which is easily measurable; on the other hand, it may also be explained by the extreme rarity of work on the educational aspects of reform, which means that reformers draw at random on unsystematic documentation for information on projects in other countries - projects which cannot simply be copied and knowledge of which is both fragmentary and limited to the initiated few. The idea of systematic study - job evaulation, description of career requirements and classification analysis of student population at entry, description of educational aims, systematic evaluation of their achievements - has to date been totally ignored. For example, the figure of 30% as the proportion of specialists amongst those graduating appears to be the result of an intuitive choice: there is nothing to indicate how it was arrived at, nor is it clear what plans there are to ensure that decisions of this magnitude are made along rational lines instead of empirically.

4. REFORM OF ADMISSION SYSTEM

There are at present 2 schools of thought on the ways in which the admission system might be changed.

One favours the setting of a numerical limit, determined primarily on the basis of the teaching facilities and particularly on the number of hospital places available. The proposals put forward are for total annual intakes of between 4,000 and 6,000 medical students.

The other view stresses the danger of a shortage of doctors and, on the basis of population forecasts, considers an annual figure of 6,000 qualified doctors as a minimum requirement which can only be met by enrolling a much higher number of students at the start of the course.

4.1 Arguments in favour of a numerus clausus. Those who hold to the first school of thought argue as follows:

1. If the clinical training facilities are overloaded, the quality of doctors will decline. The criterion of hospital training capacity is the ratio of the number of beds to the number of Part 2 students. Attempts are being made to analyse actual hospital posts in order to arrive at a clearer picture of the various aspects of hospital work which may be useful elements in the training of medical students.

2. A surplus of doctors will mean a lowering in morale among doctors as they feel themselves responsible for over-consumption to the detriment of the

national economy. The introduction of automation into medicine will improve efficiency.

3. Not all the students who now enrol for the first year of the PCEM are equipped to follow a long and difficult course of study. The most capable of them must be selected, either by means of a test or competitive examination for admission to the first year of the PCEM, or at the end of the first year or right at the end of the PCEM course.

Among those who hold this view, some favour a PCEM of 2 years covering a variety of subjects, with doctors playing a large part in the teaching; the course would not be structurally integrated with the CHU but would include a large proportion of optional tuition in the manner of an American college. The opposite view is held by those who advocate that the PCEM should be fully integrated with the CHU, including the preparatory year, the medical aspect of which would thus be catered for. It is pointed out that, in effect if not in theory, this would increase the isolation of schools of medicine from the rest of the university.

4.2 Argument against a numerus clausus. Support for a non-selective system as distinct from the one described above is found among both teachers and students, marshalling a whole battery of arguments - some economic, some practical, some political or ideological. They are as follows:

1. Demand for medical services is growing faster than the expected increase in the number of medical students. There are at present a very large number of students at university because of the population bulge which will begin to level out in 3 or 4 years' time. This is a temporary state of affairs, and must not mislead us into adopting restrictive measures which will in any event take effect too late and in the long run may well make the present shortage of doctors even more acute.

2. The proportion of qualified doctors opting for general practice is decreasing and will probably continue to decrease. The proportion of women students is growing slowly and steadily; but they abandon their studies more often than men do, and, once they are qualified, their professional careers are shorter than those of their male counterparts. Like people in other professions in their income bracket, doctors retire earlier, take longer annual holidays, and set up practice later.

   For a given number of newly qualified doctors, the available labour force decreases in the course of time. Automation will undoubtedly make practising doctors more efficient, but it will probably not mean that fewer doctors are required. Except in respect of this last point, the facts put forward are borne out by the figures.

3. By bringing the different branches of the medical profession together, it should be possible to provide career guidance at university for students in medicine, pharmacy, dentistry, veterinary medicine and for future medical technicians. Throughout the PCEM, therefore, students must be assisted in their choice and account must be taken of their aptitudes and attitudes. It must be recognised that the present social and professional status of medicine makes it rather utopian to hope that guidance could be given without coercion of any kind.

4. The sternest critics of selection base their arguments on more concrete factors:

   . Even if selection is desirable, the aim of the selection must be clear, and the aim (or aims) must be compatible with general health policy. There must be a reliable method whereby the future career pattern of students can be predicted several years in advance. No such method yet exists, and the recent survey conducted by SIREM shows that, when it

comes to predicting future occupations, the people questioned (those who might later be engaged in those occupations) have nothing precise to offer but simply repeat in random order the various suggestions made in the questionnaire, including those which it is known from experience are of no value in decision-making.

4.3 Summing up. Each side in the debate agrees on the great variety of ways in which medicine may be practised, and probably also on the very varied characteristics of the individuals practising it; but they are neither able nor willing to define the ideal type of person for the medical profession.

Without either a defined objective, a suitable method, competent personnel, or the financial resources to study the problem, the selection of medical students is quite clearly regarded as a subject likely to raise strong feelings both for and against. As yet, there has been no constructive approach to the problem in France.

- In particular, no serious consideration has ever been given to a system of selection which would, among other things, establish a numerical intake such that medical students would be broadly representative of the social and cultural background of the population.

Post-scriptum

Since the preparation of the report each faculty of medicine has been authorised to select those students whom they want to admit to the second year. The number of second year students to be admitted will in principle have to depend on the hospital training facilities available. It is still too early to judge what implications this new regulation will have in practice.

5. REFORMS OF PARAMEDICAL EDUCATION

An Interministerial Committee set up at the beginning of 1970 to promote reforms in the paramedical professions devotes much attention in its report to the question of the organisation of training for health service careers.

Faculties of science and medicine will train:

- Biomedical engineers: studying electronics, electromechanics, mathematics and data processing, chemistry, toxicology and nutrition, behaviour and organisation (300 to 500 students per annum by 1980);

- Environmental engineers: responsible for hygiene, welfare and the protection of amenities (40 students per annum - 400 posts to be created by 1982).

The university institutes of technology (IUT) will train:

- Medical and pharmaceutical laboratory technicians;

- Dieticians (4,000 to be trained by 1982; 300 to 500 qualified staff per annum);

- Biomedical technicians (750 trained by 1982);

- Environmental technicians (2,500 trained by 1982; 200 to 250 qualified staff per annum).

The professional colleges will train:

- Nurses, welfare officers, specialised teachers, midwives, masseurs/physiotherapists, laboratory staff, X-ray technicians, chiropodists, speech therapists, orthoptists etc.

As will be seen, the different training courses are segregated under this system. It is suggested, and envisaged, that an attempt at integration might be made by enabling some students to transfer from the PCEM to the IUTs or the professional colleges, by providing a varied preparatory training. Judging from the preliminary results of a SIREM survey on the way in which this preparation might be given, it cannot be expected to come about in the medium term.

However, the Interministerial Committee observes that the dividing line between the public health field and the social field is becoming increasingly uncertain, and that an effort should be made to provide staff, and training, that are complementary in this respect. These professions have 2 things in common with the profession of medicine. All are professions based on human relationships. They call for knowledge and training in both the social sciences and in physical sciences. A logical consequence is the establishment of a common minimum programme for students finishing their PCEM and wishing to enter professions such as nursing, physiotherapy, social welfare and specialised education. To avoid bitterness on the part of the students and the displeasure of health and social service workers, 2 preconditions should be agreed to:

1. Training for the professions which medical students might enter should be free;

2. It would be highly desirable for persons with qualifications in the existing socio-medical professions to be able in turn to follow a course in medicine and thus enjoy certain advantages or exemptions automatically granted to holders of professional qualifications. Institution of the corresponding procedures would presuppose:

   - reform of the PCEM, with a few limited experiments to begin with;

   - agreement between the ministries responsible, ie the Ministry of National Education, the Ministry of Public Health and the Department of Social Welfare and Rehabilitation;

   - amendment of official regulations on qualifications for state-registered nurses, midwives, welfare officers, physiotherapists and specialised teachers, so as to give official backing to the third condition set out above;

   - the signature, under Article 5 of the "Loi d'Orientation Universitaire" of agreements between the universities and the schools concerned.

The experience of the recent past suggests that it may be a long time before some of these conditions can be met.

6. REFORMS OF MEDICAL EDUCATION

6.1 Part 1 (PCEM). All decisions regarding courses must be taken on a proposal from a committee comprising teachers and students. Teaching must be given in the basic sciences, excluding the clinical sciences, and need not necessarily include a period of introductory hospital training. The course must last at least 30 weeks, and if possible 35 weeks. The whole basic science course must not be completed in 2 years; part of it must be reserved until Part 2 and incorporated into the clinical course. During the PCEM, the basic sciences may be taught either by subject or in the form of 50-hour units. There are 2 possible programmes:

1. The traditional course: 9 compulsory subjects

	Minimum		Maximum
Physics and mathematics	75		
Biophysics	75	150	250
Chemistry	75		
Biochemistry	100	175	250
Biology	75		
Histology, embryology	75	150	250
Physiology	150		200
Anatomy	125		200
Psychology, social and economic sciences	25		100
	775		

The course must occupy a total of between 1,075 and 1,150 hours.

The course material may be spread over the 2 years of the PCEM provided that at least 6 compulsory subjects are dealt with each year. Each university has a margin of choice represented by the difference between the maximum and minimum hours prescribed (1,075 - 775 = 300 hours)

2. Course divided into units:

775 hours for the basic programme
300 to 375 hours for the optional programme.

Studies must be divided between the 2 years of the PCEM in such a way that units embracing 6 subjects are studied each year.

3. Whatever teaching scheme is adopted, a course must be provided which leads up to the first part of the "programme of study and research in human biology", with a timetable of 100 to 150 hours.

4. From the very start of the first PCEM year, intensive teaching must be provided in order to help the students reach the necessary standard to follow the scientific courses. An optional English course is recommended.

It must be pointed out that none of the educational proposals put forward in the report from which the data are extracted goes any further than dividing up the timetable.

Relative to the situation as it used to be, the only innovation lies in the introduction of an optional system and the first move towards interdisciplinary integration.

Nothing is said about educational aims, nor about the means whereby they might be attained. This is invariably where most of the suggested reforms fall down; they completely overlook everything to do with the science of education and the ways in which it might be applied in the training of doctors.

Reference is made to the setting up of co-ordination committees for health education and research units (UER) in the universities.

6.2 Part 2 (DCEM). The general principles for the studies during the DCEM are:

- to provide high-grade training both for the general practitioner and for the specialist;
- to allow each UER some teaching autonomy;
- to put an end to the tuition which continues to take place outside the university (lectures for resident hospital assistants);
- to assign hospital duties to all DCEM students;
- to improve the theoretical tuition during the DCEM;
- to maintain links with medicine outside the hospitals;
- to provide training for the future practitioner in the TCEM;
- to institute post-university education to ensure effective retraining;
- duration of the DCEM: 4 years.

The first part of the DCEM consists of an introduction to hospital functions, comprising a bioclinical course (microbiology, general anatomy and pathology, general genetics, and the rudiments of pharmacology) and an introductory course in medico-surgical pathology, including theory, symptomatological practice, and preparation for resuscitation and first-aid treatment. This part should also include short periods of clinical work.

The second part comprises a course in pathology and therapeutics.

The theoretical tuition may follow traditional lines or be divided among a number of certificates, 10 of which would be compulsory:

1. Pathology of bones and joints
2. Heart and lungs
3. Digestive system, liver and nutrition
4. Pediatrics, infectious and parasitic diseases
5. Endocrinology and metabolism
6. Nephrology and urology
7. Hematology, cancerology and immunology
8. Neurology and psychiatry
9. Gynaecology and obstetrics
10. Preventive and social medicine

In addition to these 10 certificates, students would have to choose at least 2 optional ones from among the following:

- advanced certificates;
- certificates for specialities not included in the above list (opthalmology, oto-rhino-laryngology, stomatology, dermatology etc);
- certificates in the human biology course;
- certificates awarded by non-medical UERs.

Clinical and hospital training lasts for 3 years (the second, third and fourth years of the DCEM). The students occupy the position of non-resident hospital assistants under the old system.

6.3 Part 3 (TCEM). The TCEM is as yet an ill-defined entity.

General practitioners will be trained by the performance of resident duties in non-university hospitals for one year, and if possible for 2 years. Additional courses in therapeutics, study of the "doctor-patient relationship" and the economic and social organisation of the health service will be provided as part of the post-university education system.

The training of specialists will comprise working as resident hospital assistant, together with specialised theoretical teaching and participation in research work.

Resident assistants would be recruited by a single recruitment procedure making maximum use of a selection system based on individual motivation. This recruitment should be a two-stage procedure, and should take account of the number of resident places available: initially, each UER would forward a list of suitable candidates at the end of the DCEM, the number of candidates being 20% more than the number of places available locally. In the second stage, the students on these lists would take a competitive national examination, which they would be entitled to enter twice and for which they would be allowed to offer 2 papers from among the following:

- medicine
- surgery
- gynaecology and obstetrics
- radiology
- anaesthesia and resuscitation
- pediatrics
- oto-rhino-laryngology, opthalmology, stomatology
- biology
- psychiatry (?)

Deferred recruitment might be envisaged.

Depending on the papers chosen, specialist courses should last from 3 to 5 years.

A marked feature of this chapter as a whole is the extremely general nature of the proposals made and the absence of any recommendations or suggestions which might help the UER to implement the reforms proposed. There is no mention of methods whereby these principles, which are largely concerned with regulations, might be applied. There is undoubtedly a major lack of reforming spirit, reflected here again by the educational immaturity of those who devise these plans. An effort to remedy the situation would in no way run counter to the development of university autonomy.

7. ASSESSMENT AND EXAMINATIONS

7.1 Diplomas awarded

- Part 1 certificate;
- temporary qualification at the end of Part 2;

- national diploma of doctor of medicine, at the end of Part 3;

- specialist qualification at the end of the resident assistant period;

- degree in biology at the end of the "human biology" course.

7.2 Assessment. No indication is given of the ways in which the knowledge acquired is to be assessed. All the report of the Interministerial Committee has to offer is a series of suggestions about regulations which it would be tedious and superfluous to discuss here.

The only concern expressed is for the introduction of a selective system; here the numerical arguments are paramount. Over the last 10 years or so, much use has been made in France of objective examinations involving multiple-choice questions. The experiment has been only a partial success, for lack of any coherent policy on education and training in which such tests might have played a part. Considered in isolation, this part-success should not be taken as prejudging the future of objective examinations and the place they will occupy alongside traditional written and oral examinations.

The idea of a national examination to be taken at the end of the DCEM is rejected by the Interministerial Committee: "At a time when the autonomy of the UERs is being established with some difficulty, such an examination would probably tend to be unacceptable if it were relatively strict, and valueless if the standard were too elementary".

It seems then that objective assessment of the training provided by each UER has been rejected for fear of its unpopularity, and that notions as imprecise as the strictness, or unacceptably low standard, of an examination, continue to persist in the minds of the reformers.

Educational policy is thus reduced to a body of doctrine as far as regulations are concerned, and a laissez-faire approach when it comes to assessing the work actually done.

As an indication, Table 5 shows the stability of the examination system in its effects on study courses during a period in which numerous changes were made in the system applied in the medical faculties.

Table 5 - Success rate in end-of-year examinations. State doctorates in medicine.

		1961	1963	1965	1967
Preparatory year		0.741	0.670	0.663	0.630
1st year		0.742	0.662	0.757	0.758
2nd year		0.832	0.814	0.745	0.878
3rd year		0.933	0.953	0.911	0.925
4th year		0.931	0.938	0.865	0.842
5th year		0.943	0.976	0.975	0.925
Clinical studies	(surgery	0.994	0.997	0.979	0.943
	(medicine	0.995	0.989	0.938	0.930
	(obstetrics	0.995	0.996	0.955	0.938

8. ORGANISATION OF FACULTIES OF MEDICINE

The situation in the small university towns is very different from that in the large cities, notably Paris. There used to be no link at all between the faculties of medicine and the rest of the university. The creation of universities as provided for in the University Programmes Act will have the effect, in theory, of establishing these links. A powerful conservative movement tried to blunt the effect of this law by creating a medical university in Paris. The attempt was a failure, and the various university hospital centres (CHUs) are now attached to the 13 universities in the Paris area.

The position of the faculties of medicine, as regards the DCEM and the TCEM, within the newly created universities does not appear to have given rise to any great difficulty. There seems to be fairly wide support for the idea that they are professional colleges, and accordingly they enjoy extensive autonomy.

It may well be that this view will be called into question in a few years' time and that real progress may be made in integrating the schools of medicine into the universities and the system of schools preparing students for paramedical careers.

The PCEM continues to constitute a problem, and 4 types of administrative arrangement are envisaged:

1. A separate and independent Part 1 UER: This implies provision for teaching in a variety of subjects and provision for student guidance; but it will also mean difficulties of co-ordination with the DCEM as regards both the teaching and the teachers' careers and research work.

2. A Part 1 UER with open options: This solution, the administrative implications of which are not yet clear, would be intended to have the advantages of solution 1 but without its drawbacks.

3. A PCEM organised exclusively by the medical UERs with the possible assistance of the UERs in pharmacy, science and dental surgery. This would be in keeping with a trend towards emphasis on medical studies during the preparatory year which has often been pointed out and which would aggravate the isolation of medical students in the newly established universities. This solution, it seems, would involve early selection, preferably before enrolment in the first year of Part 1.

4. As an intermediate solution, a Department of Part 1 Studies common to a number of UERs could be set up.

The choice between the 4 systems outlined above will lie with the university assemblies themselves.

Once again, it is clear that the reformers, unable to bring an imaginative approach to education, have given free rein to their legal talents - frequent phenomenon in this country, and one which never fails to find support, so that instead of discussing essential aims we find the argument concentrating on forms and structures.

No attempt has yet been made at the national level to redistribute tasks between different medical schools. Table 6 shows the numerical distribution of doctorates as a function of time, and indicates that while Paris remains stable, the provinces are expanding. Too much importance should not be attached to the actual numbers of doctorates; they are the result of a great many factors, some of which (for instance, the development of certain special fields in the provinces) may have had the effect simply of moving a number of final-year students from one university to another.

Table 6 - Faculties of medicine - state doctorates awarded by various universities (French and foreign students)

Universities	1961		1968	
	Numbers	%	Numbers	%
Aix-Marseille	138	6.0	207	6.8
Amiens	-	-	12	0.3
Angers	-	-	23	0.7
Besançon	-	-	23	0.7
Bordeaux	185	8.0	295	9.7
Caen	-	-	-	-
Clermont-Ferrand	42	1.8	56	1.8
Dijon	-	-	27	0.8
Grenoble	-	-	51	1.6
Lille	130	5.7	168	5.5
Limoges	-	-	-	-
Lyon	180	7.8	233	7.6
Montpellier	129	5.6	221	7.3
Nancy	87	3.8	136	4.4
Nantes	44	1.9	63	2.0
Orleans	-	-	43	1.4
Paris	1,067	46.7	1,075	35.5
Poitiers	-	-	-	-
Reims	-	-	8	0.2
Rennes	78	3.4	75	2.4
Rouen	-	-	19	0.6
Strasbourg	88	3.8	139	4.5
Toulouse	112	4.9	153	5.0
Total	2,280		3,027	

CONCLUSION

The process of creating independent universities is now under way; and the movement towards interdisciplinary integration within these universities seems likely, despite the reservations of the medical world, to help reinstate medicine inside the universities and afford a variety of experimental organisational arrangements, between which comparisons will be possible.

The interest being increasingly shown by people holding responsible positions, in the definition of a health policy and purposive planning, extends to the problems of initial vocational training and further training. The probable outcome will be closer relations between the sciences of education and their potential applications in medical schools.

For the moment - and this is a feature peculiar to France - the bulk of the effort is apparently directed towards structures, with the constant danger that excessive regulation will mean rigidity in the teaching set-up. But despite appearances, alongside the laissez-faire attitude to educational practice, there are the beginnings of a movement more favourable to the definition of objectives, the definition of the resources needed to achieve them and to evaluate the results obtained.

In a closed world, such as the medical world of hospitals and universities still is, attitudes and habits change very slowly.

C H A P T E R I I I

ITALY

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1. PRESENT SYSTEM

The age of admission to the university in Italy cannot be less than 17. The average age of admission is 18-19; there is no upper limit. Usually an Italian university student would have started his curriculum when he was 6 years old and would have attended the following schools:

- elementary school 5 years
- uniform middle school 3 years
- secondary school 5 years

Recently, admissions have been granted also to students coming from a 4 year secondary school on condition that they have followed a one-year "integration" course.

In summary anyone who has any type of schooling of 13 years' duration may have access to the university.

There is neither numerus clauses nor entrance examination.

The undergraduate study course in medicine and surgery ("Medicina e Chirurgia") lasts 6 years and it is essentially divided in 3 periods; a basic period with such basic subjects as physics, chemistry, biology, anatomy and biochemistry; a propedeutic period with subjects such as physiology, pathology, and experimental medicine; and finally, a clinical period with medical and surgical clinics as well as short courses on all the clinical subjects.

More modern medical schools have divided the 6 year course in 2 periods only: a pre-clinical and a clinical one.

Under all circumstances, the students can attend the following period only if the study plan of the previous one has been completed.

It is fair to remember that the students can attend lectures and courses on some "complementary" subjects; the main subjects, however, required for graduation are not less than nine-tenths of the total (27).

Recent liberalisation of study plans has not helped to improve the situation as expected (and actually obtained in other faculties) because of persistent striking inadequacies of university medical structures and personnel. Large optionality is also discouraged since academic power remains with faculty members teaching traditional (main) subjects.

The diploma awarded at the end of the undergraduate study course is called baccalaureat ("Laurea di Dottore in Medicina e Chirurgia").

Usually, examinations are oral. So-called pre-examinations may be written and may include practical exercises.

During the second semester of the 6th year of the undergraduate study course, either before or just after the bachelor's degree, the student or newly-graduated doctor must work in a hospital. After this poorly organised training period and the state board examination, which must be taken after the degree is awarded, the medical doctor can become an independent practitioner with no limitations whatsoever. However, the practitioner can attend one of several post-graduate schools of different duration (from 2 to 5 years, according to specialities) with courses organised at the undergraduate school.

2. REFORM IN TERMS OF OBJECTIVES

Present undergraduate, as well as postgraduate, instruction and training are centred on hospital patients. Hospital medical care however covers less than 10% of present health problems in the general population.

Medical instruction and training indeed must be reformed in view of the 3 main aspects of promotion of health which are emphasised currently: prevention, care and rehabilitation. Structures and organisation of health departments in the university medical schools should be reformed accordingly.

Medical students should be provided with the medical background which is necessary to offer not only individual medical care but also to perform team work as required by the proposed national health service articulated upon local health units and devoted to promotion of health and social security rather than medical care only.

It is proposed that the general practitioner should undertake the initial medical care.

Specialised medical teams and services for preventive medicine should cover larger and larger portions of the general population.

On the other hand hospital services and personnel (out-patient and in-patient clinics) should deliver specialised medical service for care and rehabilitation.

Thus the dilemma: a general practitioner-specialist should be substituted by the alternatives: specialisation for prevention, care or rehabilitation.

3. REFORMS CONCERNING ADMISSION

Structures and personnel now available are adequate for no more than one third of the present number of university students. This results in lowering the quality of training. To correct the situation either more resources have to be invested in university faculties or admission standards have to be raised to drastically decrease the number of students.

Drastic curtailment of admissions has never been considered since it would accentuate the discriminative class character of the present university. Recently a law has actually relaxed admission standards. In the absence of additional financial support and reform this measure will exacerbate present inadequacies because it would increase the pressure on scarce facilities for instruction.

On the other hand the state is not yet ready to finance adequate facilities for an unlimited number of university students. It is thus hard to escape the conclusion that the quality of training will not improve and may indeed continue to deteriorate.

Confronted with this dilemma more or less radical proposals have been advanced. Among these is a proposal apparently innocuous - even conservative - but actually very revolutionary. This is to gradually enlarge the given number of admissions of a student population with social and economic composition similar to the general population. At first this appears conservative but such a suggestion would not be far short of being revolutionary. This is because the current admissions are concentrated in high income classes. Under the proposal more than 60% of working class students instead of the present 10% would gain access to the university.

Whatever the long-term merits of such a proposal the exclusion of a tremendous number of people from instruction and professions at university level might help to reveal dramatic contradictions of a society that espouses the principles of equal opportunities but which is still highly victimised by hereditary privileges. Free

education continues to mean in fact a substantial subsidy to social groups whose family background equip them for admission to an occupation that fosters its perpetuation.

4. REFORM OF THE CURRICULUM AND TEACHING METHODS

It is generally accepted that the traditional teaching based on chairs and institutes separated for each subject is fairly inadequate. Every proposed reform of university and faculties foresees a departmental structure.

Progress in many fields of human knowledge is frequently based on progress of apparently remote disciplines. Thus it is felt that no department can be borne as a corporation, ie as a simple confluence of kindred structures and people. Provided the necessary autonomy for teaching and research, university management should be constantly opened to control by laymen in order to verify that, under any circumstance, human knowledge is saved, transmitted and incremented for the benefit of man.

The following general criteria for the foundation of university departments have been proposed with constant reference to mankind: terrestrial environment (biological and non-biological); extra-terrestrial environment; social relations; personal relations; and survival (health); history.

Undergraduate study courses in medicine should take place both in the departments of health and in the departments of natural environment as well as those of social and individual relations.

It has been calculated that, for an undergraduate course of medicine, 7,600 hours of study are necessary and that the whole course might not last longer than 4 or 5 years.

Out of 3,800 hours of group study, 2,500 might be spent in the departments of health.

Classic distinctions between medical and surgical departments are opposed on the ground that there is no disease which is entirely medical or surgical. The contingent curability of a disease with either medical or surgical means is final and not initially a step of clinical histories.

Other sub-divisions however have been proposed as far as health departments are concerned; for instance, one might foresee departments of prevention, care and rehabilitation as well as further sub-divisions according to age (growth, adult and advanced).

The propedeutic, pre-clinical character of subjects like chemistry, physics, biology, pharmacology, physiology, anatomy etc also is questioned. Learning motivation of medical students might be better met by an immediate clinical approach to the study of human body structures and functions; together with courses on individual and social relations and on the natural environment. During these courses only, the student might be led to discover by himself the importance of studying the so-called basic sciences which are viewed here not as propedeutic but as actual advancement and deepening of knowledge on the human body.

Along this line emphasis should be placed on methods rather than on subjects in order of increasing difficulties and, possibly, with order required for the study of a clinical case. Radiology before anatomy, gross anatomy before histology, clinical features of infectious diseases before bacteriology and so on.

Emphasis on methods and techniques might permit a joint training of doctors, nurses and technical staff. Moroever, technical and nursing training of medical students might favour part-time utilisation of students as labour force in health institutions on one side, and favour further schooling of nurses and technicians on the other side.

Intermediate tests and examinations should be conceived in such an order as to allow larger and larger ranges of competence and responsibility in medical work.

Advanced proposals for new regulations of the one year - possibly 2 years - internship in general hospitals and other health institutions of prevention and rehabilitation - affiliated or not with university medical schools - are expected to improve the training of a general practitioner.

The same will be required for specialists; viz a postgraduate course in regional health services attached to universities, followed by a training in these or other specialised institutions for prevention, care and rehabilitation.

5. EVALUATION METHODS AND EXAMINATIONS

Some time ago it was proposed to create university degrees between the secondary school and the doctorate. If taken, the end result of such a measure might have been a further elongation of schooling. In the absence of any serious measure supporting school expenses for working-class students, those attempts are strongly opposed because of the alleged discriminative character.

A more recent proposal tends to shorten the duration of the secondary school. Thus the average age of admission to the university could be about 16 and the age of medical graduation about 20. This could leave ample time for an additional medical training period of 2 years.

The Italian technological gap also concerns the use of educational technology like television and other audio-visual aids and computers. It is proper to emphasise here that, rather than traditional teaching based on lectures, these types of teaching can only be oriented and/or based on a multiple choice system. Thus reform and new ideas concerning evaluation and examination methods based on objective criteria like multiple choice tests with computer aid cannot be discussed yet.

At the present time emphasis is placed on strict connection between instructors and small groups of students; under these circumstances it is expected that the importance of final traditional examinations is de-emphasised by continuous evaluation over a long period of time.

6. ORGANISATION AND LOCATION OF MEDICAL SCHOOLS AND FACULTIES

Research fields are currently referred to either as fundamental (basic and oriented) or applied (R & D). These 2 fields are broadly separated but they largely overlap with the 2 fields of higher education and professional training, respectively.

Biomedical, fundamental research and instruction as well as applied research and professional - general and specialised - medical training are supposed to fit this general pattern.

Since any progress of an advanced industrial society is apparently based on progress of applied research and development and since the latter is apparently depending on fundamental research and higher education, interaction between the 2 fields has to be encouraged by: increasing and balancing financial support; modern management of proper institutions; preparing the ground for such in interaction between "producers" and "consumers" of fundamental research and higher education.

Private and public enterprises involved in applied research and development as well as in professional training might be retained under (or transferred to) the control of state agencies such as ministries of public health, industry, agriculture, defence, balance and economic programmes etc.

On the other hand, universities are supposed to be the main producers of fundamental research and higher education. Accordingly, it has been proposed that universities and similar institutions be brought under the Ministry of Basic Science, Research and Higher Education while elementary school, uniform middle school and secondary school might remain under the administrative control and planning of the Ministry of Public Instruction and its regional branches.

Recent reform of hospital organisation and planning are expected to enhance a more uniform distribution of first-rate regional hospitals throughout the country.

Reorganisation of health programmes under unified control of local health agencies ("Unità Sanitarie Locali") has also been recommended.

General and specialised medical training, as well as applied medical research and development, might be located outside the university medical schools in some regional teaching hospitals and other adequate public health institutions.

On the other hand, undergraduate and postgraduate medical instruction - as well as fundamental biomedical research - should remain located within the universities, however, management of health care connected with biomedical instruction and fundamental research should always be regulated by proper co-operation between universities and local health agencies in order to guarantee subordination of university teaching and research requirements to physical and moral rights of the citizen. The proposed conventions are also expected to favour both the growth of existing (and location of new) medical schools and the upgrading of local health institutions.

A more rational planning for location and growth of university and related medical schools is also claimed.

At the present time, however, the widening gap between health reorganisation programmes already under way and delayed university reform will favour current opposing trends. On the one hand, conservative clinicians try to keep university hospitals, free from control by local administration and planning of public health. On the other hand, attempts to separate medical schools from the university (strongly supported by the "Ministero della Sanità" and local health authorities) if successful, might prevent future rearrangement of medical studies with expectedly fruitful intertwining between the so-called pre-clinical and clinical studies. In both cases, exchange between basic medical, other non-medical teaching and research institutions might become more difficult than at the present time.

A N N E X E

LIST OF SCHOOLS AND COURSES OF SPECIALISATION
IN THE MEDICAL SCHOOLS IN ITALY

LISTE DES COURS DE SPECIALITES DANS
LES FACULTES DE MEDECINE EN ITALIE

Number of Schools Nombre des cours	Name of courses Matière	University Université	Duration (Years) Durée (Années)
1	Anatomia ed istologia patologica	Bari	3
1	Anatomia ed istologia patologica e tecniche di laboratorio	Milano	3
1	Anatomia patologica e tecnica di laboratorio	Parma	3
4	Anestesia	Bologna Firenze, Milano e Roma	3
5	Anestesiologia	Catania, Ferrara, Napoli, Perugia e Pisa	2
13	Anestesiologia e rianimazione	Bari, Milano, Messina, Cattolica Milano, Parma, Pavia, Siena, Torino, Palermo, Padova, Genova, Cagliari e Modena	3
1	Angiologia	Genova	2
1	Angiologia ed in angiologia e chirurgia vascolare	Milano	3
1	Allergologia	Firenze	3
1	Biometria e statistica medica	Milano	3
4	Cardiologia	Bologna, Cagliari, Milano e Torino	3 2
1	Cardiologia e mallatie dei vasi	Napoli	3
1	Cardiologia e reumatologia	Pisa	3
1	Cardioangiochirurgia	Torino	2
1	Cardio-reumatologia	Ferrara	3
8	Chirurgia	Bologna, Milano, Napoli, Padova, Pavia, Perugia e Roma (2 schools/ 2 facultés)	5
10	Chirurgia generale	Bari, Cagliari, Catania, Ferrara, Firenze, Modena, Palermo, Parma, Pisa e Torino	5

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Number of Schools Nombre des cours	Name of courses Matière	University Université	Duration (Years) Durée (Années)
I	Chirurgia generale e terapia chirurgica	Genova	5
2	Chirurgica dell'apparato digerente	Firenze e Roma	3
2	Chirurgica dell'infanzia	Padova Milano	3 2
1	Chirurgica pediatrica	Ferrara	3
2	Chirurgica plastica	Torino e Padova	3
1	Chirurgica plastica ricostruttiva	Milano	3
1	Chirurgica polmonare	Torino	2
5	Chirurgica toracica	Bologna, Firenze, Milano, Napoli e Roma	2
5	Chirurgica vascolare	Napoli, Bologna, Palermo, Cattolica Milano e Roma	2 3
1	Clinica del lavoro	Firenze	2
6	Clinica dermosifilopatica	Ferrara, Palermo, Cattolica Milano, Modena, Pavia e Torino	2 3
1	Clinica ototinolaringoiatrica	Bari	3
1	Clinica delle malattie infettive e tropicali	Modena	2
1	Clinica delle malattie tropicali e subtropicali	Roma	2
3	Clinica delle malattie nervose e mentali	Parma, Siena e Perugia	3
1	Clinica delle tubercolosi e delle mallatie delle vie respiratorie	Roma	2
1	Clinica neuropsichiatrica	Modena	3
1	Clinica odontoiatrica e stomatologica	Milano	2
2	Clinica ostetrica e ginecologica	Ferrara e Modena	4
2	Clinica otorinolaringoiatrica	Bari e Ferrara	3
11	Clinica padiatrica	Ferrara Bologna, Messina, Parma, Pavia, Palermo, Cagliari, Cattolica Milano, Bari, Catania e Firenze	2 3

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
2	Criminologia clinica	Roma e Genova	3
1	Dermatologia	Genova	3
1	Dermatologia e venereologia	Milano	3
1	Dermatologia e sifilografia	Napoli	2
2	Dermosifilopatia	Pavia Roma	2 3
4	Dermosifilopatica	Bari, Cagliari e Padova Pisa	2 3
1	Dermosifilopatia e venereologia	Bologna	2
1	Diagnostica di laboratorio	Ferrara	2
1	Educazione fisica	Bologna	1
3	Ematologia	Ferrara, Pisa e Roma	2
4	Ematologia clinica e di laboratorio	Genova Padova, Cattolica Milano e Pavia	2 3
4	Endocrinologia e mallatie del ricambio	Firenze, e Parma Perugia e Napoli	2 3
1	Endocrinologia e mallatie metaboliche	Roma	3
3	Endocrinologia	Torino e Pavia Pisa	2 3
1	Farmacologia applicata all'industria	Milano	2
1	Farmacologia applicata	Modena	2
1	Farmacoterapia e tossicologia medica	Roma	2
1	Fisiochinesiterapia	Firenze	2
1	Fisiochinesiterapia ortopedica	Bologna	2
1	Fisiocinesiterapia	Parma	2
1	Fisiochinesiterapia e rieducazione neuromotoria	Genova	2
1	Fisiologia e scienza dell'alimentazione	Cagliari	2
2	Gastroenterologia	Perugia e Roma Cagliari e Parma	2 2
6	Gerontologia e geriatria	Modena, Firenze, Pavia e Torino	3
4	Igiene	Genova, Parma, Roma e Torino	3
1	Igiene ed epidemiologia	Milano	2
10	Igiene e medicina preventiva	Genova, Bari, Pavia, Firenze, Padova, Catania, Perugia, Cagliari, Sassari e Palermo	3

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
2	Igiene generale e speciale	Messina e Napoli	2
4	Igiene e medicina scolastica	Bologna, Pavia, Pisa e Messina	2
2	Igiene e sanita pubblica	Bologna e Pisa	2
2	Igiene e tecnica ospedaliera	Milano e Roma	2
2	Igiene, tecnica e direzione ospedaliera	Pisa e Messina	2
1	Idroclimatologia clinica	Roma	2
1	Idrologia, climatologia e talassoterapia	Milano	2
2	Idrologia, crenologia e climatoterapia	Parma Napoli	2 1
1	Idroclimatologia medica e Clinica tenuale	Pavia	3
1	Idrologia medica	Pisa	2
1	Immunoematologia	Pisa	2
1	Leprologia e dermatologia tropicale	Genova	3
2	Malattie cardiovascolari e reumatiche	Firenze e Siena	3
8	Malattie dell'apparato cardiovascolare	Catania, Cattolica, Milano, Padova, Bari, Pavia, Roma e Perugia	3
1	Malattie dell'apparato digerente e del ricambio	Modena	2
2	Malattie dell'apparato digerente	Bari e Sassari	4
1	Malattie dell'apparato digerente e del sangue	Firenze	2
1	Malattie dell' apparato digerente, della nutrizione e del ricambio	Torino	2
2	Malattie dell'apparato respiratorio	Padova e Torino	2
1	Malattia dell'apparato respiratorio e tisiologia	Pisa	2
2	Malattie del fegato e del ricambio	Ferra e Roma	2
1	Malattie del ricambio e dell'apparato digerente	Milano	2
1	Malattie del sangue	Modena	2
1	Malattie del sangue e del ricambio	Catania	3

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
1	Malattie del rene, sangue e ricambio	Messina	3
2	Malattie del tubo digerente del sangue e del ricambio	Pavia e Pisa	2
1	Malattie endocrine e metaboliche	Cagliari	2
3	Malattie infettive	Pavia e Roma Genova	2 3
1	Malattie infettive e tropicali	Napoli	3
1	Malattie infettive tropicali e subtropicali	Messina	2
4	Malattie nervose e mentali	Bari, Firenze, Napoli e Pisa	3
3	Malattie veneree e della pelle	Parma Catania e Firenze	2 3
2	Medici laboratoristi	Roma e Pavia	3
1	Medicina aeronautica e spaziale	Roma	2
1	Medicina costituzionalistica ed endocrinologica	Genova	2
4	Medicina generale	Bologna e Genova Parma e Pisa	5 4
10	Medicina interna	Bari, Milano, Napoli, Padova, Pavia Perugia, Palermo, Torino, Cagliari e Roma	5
12	Medicina del lavoro	Cagliari, Palermo, Padova, Pavia, Bologna e Genova Milano, Messina, Napoli, Pisa, Roma e Torino	3
1	Medicina delle assicurasioni	Pisa	2
2	Medicina dello sport	Napoli Milano	2 3
1	Medicina fisica e riabilitazione	Milano	2
13	Medicina legale e delle assicurazioni	Bologna, Firenze, Genova e Napoli Pavia, Roma, Catania, Palermo, Siena, Milano, Torino, Bari e Modena	2 3
1	Medicina legale ed infortunistica	Padova	2
3	Medicina ed igiene scolastica	Milano, Napoli e Parma	2
5	Medicina nucleare	Milano e Pisa Firenze, Roma e Cattolica Milano	2 3

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
1	Medicina scolastica	Torino	1
1	Medicina tossicologica	Firenze	2
4	Microbiologia	Parma, Roma, Torino e Pisa	3
1	Microbiologia medica	Genova	2
5	Neurochirurgia	Torino Genova, Milano, Padova e Roma	5 4
6	Neurologia	Padova, Bologna, Pavia, Cattolica Milano, Genova e Milano	4
5	Neurologia medica	Padova, Parma, Torino, Bari e Cagliari	3
2	Neurologia e psichiatria	Cagliari e Roma	3
1	Neuropatologia e psichiatria	Torino	3
5	Neuropsichiatria infantile	Pisa Genova, Milano, Messina e Roma	3 4
2	Nipiologia	Napoli e Siena	1
1	Nipiologia e paidologia	Pisa	1
19	Oculistica	Cagliari, Firenze, Messina e Milano Bari, Bologna, Catania, Genova, Modena, Napoli, Palermo, Padova, Parma, Pisa, Pavia, Perugia, Roma, Siena e Torino	3
2	Odontoiatria e stomatologia	Firenze e Parma	2
1	Odontostomatologia	Torino	2
10	Odontoiatria e protesi dentaria	Bari, Catania, Genova, Napoli, Pavia Pisa e Roma Cagliari, Palermo e Perugia	2 3
1	Odontoiatria e protesi dentale	Padova	2
1	Oncologia generale	Modena	2
9	Oncologia	Roma Genova e Torino Bari, Cattolica Milano, Ferrara, Pavia, Pisa e Padova	1 2 3
2	Ortopedia	Catania e Milano	3
13	Ortopedia e traumatologia	Bari, Bologna, Firenze, Genova Modena, Napoli, Padova, Pavia, Pisa, Torino, Sassari, Palermo e Cattolica Milano	3
2	Ortopedia e traumatologia dell'apparato motore	Roma e Siena	3

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
20	Ostetricia e ginecologia	Bari, Bologna, Cagliari, Catania Firenze, Genova, Messina, Cattolica Milano, Milano, Napoli, Padova, Palermo, Parma, Pavia, Pisa, Perugia, Roma, Siena, Sassari e Torino	4
11	Otorinolaringoiatria e patologia cervicofacciale	Cagliari, Cattolica Milano, Genova Pavia, Siena, Torino, Bologna, Modena Perugia, Messian e Palermo	3
8	Otorinolaringoiatria	Catania, Firenze, Mailano, Napoli Padova, Parma, Pisa e Roma	3
11	Pediatria	Genova, Milano, Napoli, Perugia, Roma, Sassari, Siean e Torino	3
		Modena, Padova e Pisa	2
8	Puericultura	Padova, Pavia e Roma	1
		Sassari	2
		Genova, Bari, Cagliari e Modena	3
1	Puericultura e igiene infantile	Bologna	1
1	Puericultura e dietetica infantile	Pisa	2
11	Psichiatria	Milano, Bologna, Pavia, Cattolica Milano, Roma, Torino, Palermo, Padova, Genova, Messina e Pisa	4
3	Psicologia	Bologna, Roma e Milano	3
1	Psicologia del lavoro	Pavia	2
1	Psicologia dell'età evolutiva	Genova	3
1	Psicologia sperimentale	Milano	2
3	Patologia generale	Roma	2
		Bari e Torino	3
17	Radiologia	Bologna, Catania e Milano	3
		Cagliari	2
		Cattolica Milano, Napoli, Parma Pisa, Padova, Roma, Siena, Torino Modena, Genova, Firenze, Bari e Pavia	4
1	Radiologia medica e radioterapia	Palermo	3
1	Reumatologia	Roma	1
2	Scienza dell'aliemntazione	Modena e Pavia	2
1	Scienza dell'alimentazione e dietetica	Milano	2
1	Semeiotica e diagnostica di laboratorio	Napoli	2

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Number of Schools Nombre des cours	Name of courses Matières	University Université	Duration (Years) Durée (Années)
1	Settore laboratorista	Torino	2
1	Settori e medici laboratoristi ospedalieri	Bologna	3
2	Stomatologia (malattie della bocca e protesi dentaria)	Bologna e Modena	2
1	Storia delle medicina	Roma	2
6	Tisiologia	Bologna, Genova, Milano e Parma Sassari e Catania	2 3
2	Tisiologia e malattie dell'apparato respiratorio	Firenze e Napoli	2
1	Tisiologia e malattie polomonari	Palermo	2
14	Urologia	Bari, Bologna, Catania, Cagliari Firenze, Cattolica Milano, Milano, Padova, Palermo, Pavia, Pisa, Roma Siena e Torino	3
1	Tossicologia medica	Pavia	3

CHAPTER IV

NETHERLANDS

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1. INTRODUCTION

Medical education is a world in itself, not only by its variegation and complexity, but also by its purely quantitative aspects. In the Netherlands with a population of 13 millions, 7 medical faculties together employ close to 3,500 academical staff, the majority of whom are physicians, and have a total student body of some 12,000. In recent years, roughly one out of every 150 boys and girls at 19 years of age enrolled in one of these medical faculties, while the national government spent some 170 million dollars annually on these faculties and their academic hospitals, or close to 1.5% of its total expenditure.

This world of medical education of course has not escaped being involved in the scientific and social upheavals of our days. Medical faculties are caught in a whirlpool of changes, resulting from the development of medical science and technology and from the changing health care demands of society. Up to 1971, the administrative structure and the cultural atmosphere of our universities were still mainly rooted in pre-World War II traditions. Since then, major changes have been introduced in rapid succession with a view to encouraging a more democratic approach. At present, however, the main effect is to increase uncertainty concerning responsibilities and fields of competence. All things considered, our medical faculties are poorly equipped for planned change and are now experiencing processes of improvised adaptation rather than of controlled reform. The present report aims at analysing the nature and trends of these processes, and at drawing some prognostic conclusions for the near future.

2. THE SYSTEM

2.1 Student admission. Since the system of secondary education in this country is at present undergoing radical structural changes, any description of the preparation for the study of medicine would require considerable and detailed digression. It may therefore suffice to note that, of all 12 year old children, some 8% will eventually enter a type of secondary school which, on matriculation at age 18, qualifies them for enrolment in a medical faculty. Since no other qualification is required besides this matriculation, the number of first year students fluctuates considerably from year to year. During the last 10 years, however, the tendency has been towards continuous increase: cf Table 1.

2.2 Process and production. Formal descriptions of the curriculum tend to dominate in most discussions of medical education. Similarly, changes in the curriculum are often foremost in the thoughts of medical faculties when embarking on the programmes of educational reform. For purposes of international comparison, a description of curricula may be useful, and this aspect will be dealt with in paragraphs 2.3, 3.1 and 3.3. It should be realised, however, that the formal curriculum is a factor of secondary importance in the total educational process between admission and graduation. This process may be viewed as a composite series of interactions between educators and students. The curriculum provides the scenario, while classrooms, laboratories, clinics etc serve as tools and environment, but the quality of the total process depends on its effectiveness and efficiency in delivering the required end product.

Table 1 - Fluctuations in the national enrolment of 1st year medical students in the Netherlands, at 5 or 10 year intervals

1948	915
1950	759
1955	625
1958	742
1960	766
1965	1,423
1968	1,932
1970	1,693
1971	2,177

(Source: "Statistiek van het Wetenschappelijk Onderwijs", Central Bureau of Statistics, The Hague. For 1970 and 1971: National Council of Medical Faculties.)

The criterium of effectiveness refers to specifications for the end product, ie the specific objectives of the educational process, and thereby poses many and major unsolved problems (cf 3.2). Efficiency, however, may be approximated quantitatively by determining drop-out rate and the average time it takes a student to graduate.

Traditionally, medical faculties in this country perform with more than average efficiency, since their drop-out rate of 25-30% compares favourably with a total university attrition approximating 40-50%. Drop-outs, however, present but a fraction of the total inefficiency, since successful students include high numbers of repeaters. This may be illustrated in various ways, of which Tables 2 and 3 are examples using respectively national data and results from the Medical Faculty of Leiden.

Table 2 - National overall efficiency of medical education, as indicated by the total number of physicians graduated from classes entered 9 years previously (formal curriculum: 7 years)

Students admitted:		Physicians graduated during 9 year interval:		
year	number	number	percentage	counted cumulatively up to:
1950	759	516	68%	1959
1951	614	462	75%	1960
1952	512	425	83%	1961
1953	556	438	79%	1962
1954	630	432	69%	1963
1955	625	488	78%	1964
1956	591	498	84%	1965
1957	712	564	79%	1966
1958	742	620	84%	1967
1959	809	605	75%	1968

(Source: "Statistiek van het Wetenschappelijk Onderwijs", Central Bureau of Statistics, The Hague.)

Table 3 - Admission-graduation interval (duration of studies) of Leiden medical students graduating in 1968-69

Admitted .... years previously	Graduated as physician in 1968-69: number	percentage	average duration of studies
6 - 7 years	6	5.3%	6.7 years
7 - 8 years	45	39.4%	7.5 years
8 - 9 years	33	28.9%	8.5 years
9 - 10 years	16	14.0%	9.5 years
10 - 11 years	5	4.4%	10.7 years
11 - 12 years	3	2.6%	11.5 years
12 - 13 years	2	1.8%	12.2 years
more than 13 years	4	3.6%	18.2 years
Total number graduated 68-69	114	100%	8.6 years

(Source: University Bureau of Statistics, Leiden University)

These retrospective data of course relate to the educational system as operating up to 1968. Since then, various changes in both curriculum and teaching methods have been effected, some of them actually designed for the purpose of improving quantitative efficiency. It is pointed out, however, that data on drop-outs and repeaters reflect general cultural trends which are, it is hoped, amenable to gradual change through planned educational policies, but which cannot be switched abruptly by formal measures.

2.3 Curriculum. Up to around 1950-60, the curriculum derived, except for minor changes, from the system as observed here by Abraham Flexner in the twenties, when he made his comparative study of medical education. The basic scheme was as follows:

One introductory year, the "propaedeuse" was used for courses on physics organic chemistry, zoology and the like. Thereafter, 2 years of the usual pre-clinical courses (anatomy, physiology, biochemistry etc) lead to the examination for the degree of "kandidaat". Next, 2 years of courses in clinical subjects and in pharmacology, pathology, microbiology, after which another major examination conferred the degree of "doctorandus". This entitles the student, if he so desires, to work on a thesis and obtain the degree of "doctor medicinae", which is a purely academic title. This degree, however, in our system is not required, nor is it a licence for the practice of medicine. For this latter purpose, the "doctorandus" follows a 2 years series of clinical clerkships, after which he takes the final examination for the degree of "arts" (physician).

Since 1925, of course, some changes had been introduced, such as the addition of clerkships in opthalmology, ENT and dermatology. Also, examination techniques were gradually changed, the traditional oral examinations being increasingly replaced by written tests (mainly of the essay type), because of the increasing student numbers. In general, however, the following description of the system, as given by Flexner, still held true right up to the sixties:

"The Dutch scheme is peculiar in its total divorce of theoretical clinical instruction from practical experience of whatever kind. The student, having successfully passed his laboratory subjects, enters the clinical division, where he endures 2 years of unrelieved demonstrative lecturing. Medicine (including pediatrics), surgery, and obstetrics (including gynaecology) run through the entire period; the other clinical branches run for shorter periods; there are, besides, lectures in pathology and brief practical courses in pharmaco-dynamics

bacteriology etc. The student is, of course, surfeited with lecturing - all students apparently, in so far as they attend, hearing the same lectures. Small wonder that complaint is rife that students are passive, and that, up to this point in their training at least, individuality does not disclose itself.

At the conclusion of this prolonged exposure to theory, the student is examined on his knowledge of theory; and only after he has won his diploma, does he, as so-called "co-assistant", enter upon a series of ward posts, occupying altogether one and a half years. As "co-assistant", he services 3 months in medicine, 2 1/2 in surgery, 6 weeks in obstetrics and gynaecology, 6 weeks in psychiatry. During these periods, which fortunately come in no fixed order, the co-assistants rotate at regular intervals through the services, in-patients, out-patients, men, women etc. Their duties correspond, as far as the formula goes, to those of clerk or intern; but the rotation is so rapid and the hospital organisation itself so undeveloped that responsible and thorough participation on the student's part is unlikely. He can, indeed witness everything that goes on; he is expected, also, to take histories, work up laboratory material, and in obstetrics to participate in deliveries. But the pace is too swift and the organisation too scant to meet modern requirements in respect to the study of disease or the training of men."

(Source: A. Flexner, "Medical education, a comparative study", McMillan, 1925, p. 261)

It was only in 1966, when the new medical faculty of Rotterdam was opened, that a first radical breakthrough in this system was announced. Reasons for the tenacity of the traditional curriculum were manifold. The threatening situation of the thirties, economically and politically, was not conducive to educational self-criticism at the level of university teaching. Moreover, the medical curriculum like all university programmes in this country, is defined in a legal text, the "Academical Statutes", which until recently confined educational experimenting within narrow bounds. Finally, it should be realised that only after World War II did our field or vision, in medicine as in other cultural areas, shift from the traditional continental (Austro-German) orientation towards the transatlantic scene. This shift of perspective, however, catalysed the discontent of decades. Awareness of experiments like the Western Reserve Curriculum and of the activities of centres for research on medical education like George Miller's in Chicago, stimulated the early discussions and initiatives for change in this country. These initiatives, and the ensuing developments, are reviewed in the following paragraphs.

3. MOVEMENTS FOR CHANGE

The discontent mentioned above, probably first came to the surface in the 1950s among general practitioners who felt insufficiently prepared by the pre-war curriculum for their work in modern society. Their agitation, originally for postgraduate training and for research on the problems of general practice, secondarily brought pressure to bear on undergraduate medical education and thus gave fresh impetus to the movements for reform which were slowly taking shape within the medical faculties.

These faculties, while still trying to catch up with the scientific arrears which had accumulated since 1940, meanwhile began to be inundated by a steadily increasing and unchecked inflow of students. At the same time the increasing awareness of modern views on the educational process led to a painful realisation of the inadequacy of the way in which our faculties are used to dispense teaching programmes for the student to consume and digest at his own pace and on his own responsibility. This classical "open" approach to teaching is of course consistent with the principle of the unlimited acceptance of students, who are unselected except for the required matriculation from secondary school. It is also, however, responsible for the traditional drop-out rate and the protracted delay in graduation. These conditions are increasingly felt to be irreconcilable with the demands of today's medical and educational

sciences, especially since the confrontation with developments in other parts of the world adds to our sense of inadequacy. The 3 world conferences on medical education, the flow of literature on curricular and educational reform elsewhere, and personal contacts with new medical schools or programmes, contributed to the ferment of discontent and desire for change. In various groups, projects for curricular reform were formulated, some of the earliest stemming from junior faculty staff, eg in the University of Utrecht in 1965; or from students, eg in Amsterdam also in 1965. In its programme and organisations, the new medical faculty of Rotterdam, opening in 1966 embodied many ideas which had been ripening for a few years in the old faculties.

3.1 Revision of "Academical Statutes". Also in 1966, the Minister for Education and Sciences asked the medical faculties jointly to design a schedule for curricular reform with the dual purpose of abridging the basic training programme and incorporating specific training for general practice. In response to this request, new statutes for the programme of medical education were drawn up. These renovated "Academical Statutes" have since then been officially approved and came into force in October 1968. They signify a radical change since they opened the way for major curricular reform, while leaving all details and implementation of such reform to local faculty initiative.

In view of the legal significance of these statutes, it is of interest to study both the text of the statutes and the official explanatory annotations. Paragraph 1 of these annotations summarises the "philosophy" behind the revised text (cf Appendix).

In fact, these statutes no longer specify, as did the previous text, a list of disciplines and chairs required for the teaching programme. At present, subject areas are outlined and faculties are free to modify the way in which they fulfil their teaching obligations. Subjects may be taught department-wise or in an integrated form, and the teaching staff will be deployed in accordance with the faculty's strategy. Besides loosening the relationship between departments and curriculum components, this new arrangement facilitates the introduction of optionals in the curriculum. This latter trend should help to attract medical students into scientific careers. It should also condition future physicians to remain alert to the need for continuous self-education. If we want our students to learn how to think and how to learn for themselves, we should wean them as soon as possible from pre-digested standard courses.

3.2 General principles for change. As mentioned before, the problem of defining specific and operational objectives for medical education is as yet unsolved. However, in our country, as elsewhere, 3 central issues are recognised, leading to at least some general principles.

Firstly, it is realised that medical sciences will for the next few decades continue to develop and to diverge into ever more exacting and more rapidly changing fields of knowledge and application. It is doubtful, if the idea was ever a good one, that medical education should provide the young physician with an adequate supply of such knowledge and experience as he might need for his job. Today, anyhow, it is certain that the essential objective of medical education should be the instillation of fundamental scientific attitudes and habits rather than the indoctrination of ephemeral scientific facts.

Secondly, it is appreciated that modern medicine, because of the very scope and variety of its rapidly growing applications, can and should be practised in an unlimited number of different ways. The limitations imposed by economic and cultural circumstances, and the impact of social and technological change on health care needs, require a more flexible approach to medical practice than can be derived from the classical vision of the "art of healing". Under certain circumstances, the physician of the future should be able to appraise environmental conditions rather than somatic complaints, and to bring greater variety to his ways of functioning rather than to his prescriptions. In general, he should be able to take his place in an integrated health care system of which he himself may be required to be the main architect.

Thirdly, the traditional teaching approach has become unacceptable in the light of modern educational views. Education is now felt to be a process of interaction between teachers and students, in which both parties share responsibility for the results. Instead of widely spaced examinations, for which the students present themselves on their own initiative, systems of continuous feedback and evaluation of student progress are envisaged. Instead of unilateral teaching and demonstration, which reduce the students part to imitation, programmes incorporating combined tasks are conceived, requiring the students to participate as active partners.

3.3 Implications for the curriculum. Practical implications from the general principles mentioned above may be drawn in various ways. New curricula based on these principles should, by definition, be experimental and subject to continual revision.

The curricula changes which are now being implemented in all medical faculties in this country already show marked differences. The following list of projected changes, however, although drawn up for the Leiden Faculty, contains elements which are included in either the short-term or the long-term programmes of most other faculties too.

In pre-clinical teaching, an increase of hours in the laboratory and a decrease of formal lecture hours is indicated.

In clinical teaching, practical work in the hospital should start at an earlier phase of the curriculum. The time-ratio of clerkship to lectures should be increased. More important even, bedside teaching or clerkships should start in the third or fourth rather than in the sixth year of the curriculum.

Small group teaching, at present occupying a minor fraction of the total pre-clinical teaching time, should be increased to stimulate an attitude of active participation. In other respects too, teaching methods should be modernised in accordance with present educational views, to intensify and improve the training process.

Methods and intervals of examining should be changed to serve the new concept of examinations as educational tools rather than as hurdles to be overcome.

New disciplines, such as medical sociology, data processing, and cybernetics should be introduced, while practical training should cover forgotten areas such as literature retrieval, group interactions, and interviewing techniques. More important, however, the curriculum should offer various optionals for individual studies in depth rather than a wide range of shallow compulsory subject matter.

A prerequisite for all this is, of course, a change in both the quantity and the quality of the teaching staff. The need for increased numbers of scientific staff, to implement an intensified training programme, is evident. The need for increased scientific quality, on the other hand, is regrettably underestimated.

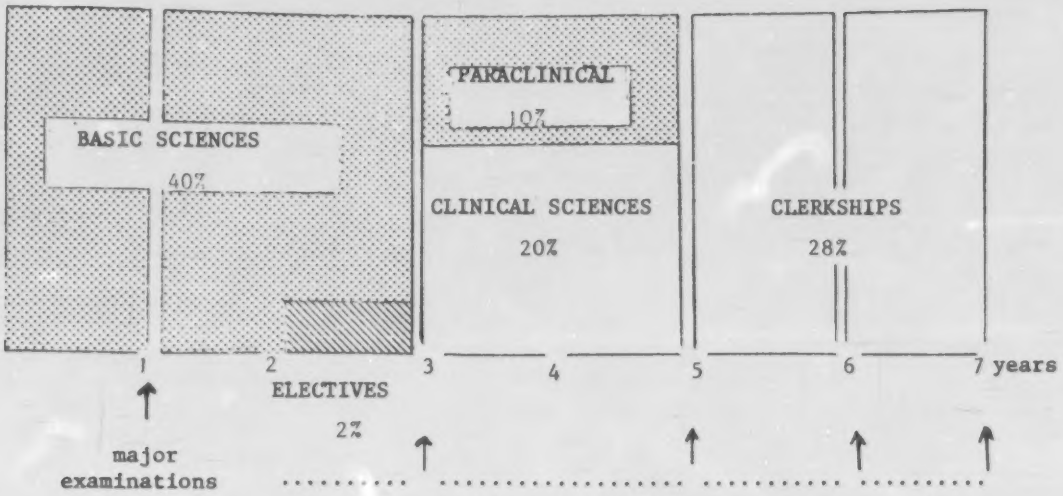
One remedy here will be to put more emphasis on postgraduate training programmes and on academical career-planning for promising scientists.

Student quality is a similarly neglected dimension. Matriculation from secondary school is the only recognised prerequisite for entering medical school, and the unchecked inflow of first-year students has for many years been a major problem. Examinations may be repeated indefinitely and classes therefore become congested with students of various ages. Each year, examinations are failed by some 30% of the participants, while somewhere between 10 and 20% of the enrolled students do not turn up for the examinations for which their class was being prepared.

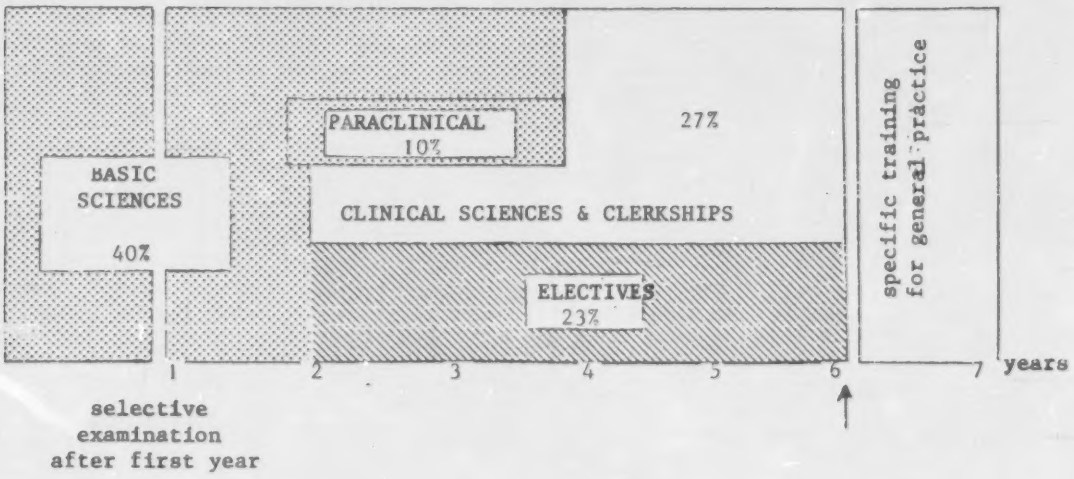
Finally, the entire educational programme should be adjusted to the actual demands of society. This means that the faculty should engage in research projects to evaluate the administrative as well as the technical structures outside the university hospital. The findings of such research should help to specify both the governmental policy in organising health care systems, and the scope and contents of the medical faculty's training programmes.

For a general summary of these changes, see Figure 1 which illustrates the previous curriculum of the Leiden Faculty, and its new curriculum as planned in 1969, although since then modified in some respects.

Figure 1 PRESENT CURRICULUM OF LEIDEN MEDICAL FACULTY (7 years)



PROPOSED CURRICULUM (6 years + 1 years specific training)



ELECTIVES : in both clinical and paraclinical medicine (Pharmacology, microbiology, pathological anatomy, etc.) or basic sciences.

: laboratory hours. Percentages are related to total curriculum time.

3.4 Formal and legal aspects. At present, necessary changes as listed above, are being formalised at various levels. The "Academical Statutes" mentioned in paragraph 3.1 have converted the previous 7 years' course, leading to a supposedly "general physician", into a 6 years' course for "assistant physician". This course is followed by a seventh year, during which the assistant physician either prepares for general practice or commences a training period for some other medical speciality. For this year, medical faculties will offer alternative training programmes, although legally the final physician is entitled to enter general practice, whatever his choice for the seventh year's course has been.

This latter clause, however, derives from present administrative barriers against recognising general practitioners on equal footing with clinical specialists. Ways to change this are at present being explored, and this may lead to subsequent changes in the nomenclature and licensing value of the 6th and 7th years' examinations. In fact, the government has recently agreed to recognise general practice as a specialisation in its own rights, requiring a specific postgraduate training course.

In the new "Academical Statutes", a "kandidaatsexamen" and a "doctoraal-examen" have been retained, but no longer serve to separate pre-clinical from clinical subjects or theoretical studies from practical experience.

In formal recognition of the need for quantitative planning in developing the new curriculum, parliament in 1970 approved a legal system of restricted entrance to the second year, after students have successfully passed the examinations at the end of the first year. This proposal temporarily brought to an end a 5 years' struggle between parliament and the medical faculties. This started when the faculties induced, in 1965, the Minister for Education to propose an entrants selection for medical education (cf paragraph 2.1). Ever since the parliamentary defeat of this proposal, reports, complaints, discussions and even one law suit have been going on to obtain some restriction of student numbers. The 1970 solution is a compromise in that admission to the first year still be unlimited, while the second year's class are kept within the limits of the faculty's "teaching capacity".

However, as the number of students seeking admission not only to medical but to other faculties is rising steadily, at this very moment a new "temporary measure" is being prepared which will entitle the Minister for Education to restrict university entrance. If successful, this proposed law will introduce, at least during the next 2 years the numerus clausus principle being adopted - not only for the medical faculties but for all other faculties as well.

Finally, it should be noted that, while all medical faculties are at present implementing a revised curriculum, they are not co-ordinated as to the calendar years when this revision started or will be completed. Foremost is Utrecht, which in June 1972 graduated the first physicians from the new curriculum. Other faculties will start on their new 7th, 6th or 5th year curricula next September, while Leiden is hindmost since it only initiated the new curriculum in 1969 and will therefore embark on its 4th year.

4. FUTURE PROBLEMS AND POLICIES

While trying to implement the changes discussed above, we are up against considerable obstacles. None of the items of 3.3 can be achieved without a programme of long-term investment in training staff and in developing laboratory and clinical educational facilities. Such a programme, moreover, should be designed in co-operation with the authorities responsible for the national educational and health care policies. These responsibilities, however, rest with 2 different ministries, and neither of them is in a position to commit itself beyond the annually approved national budget. Such are the workings of parliamentary democracy, which may be adequate for everyday business and for weathering sudden storms, but which are not equipped for designing

and developing master plans for long-term evolution. The vicissitudes of political power and the changing tides of economic feasibility are of course expected impediments to planned progress. The utter impotence, however, to conceive such long-term projects as are indispensable to the development of modern science and technology on a national scale, has deeper roots than the structure of our administrative system. It derives from the fundamental characteristics of our national or even continental culture and as such asks for a more fundamental diagnosis and therapy.

4.1 Diagnosis. Throughout the 19th and during the first half of the 20th centuries, European culture has shown ambivalent reactions to the merging power of the positive sciences. Within the systems of christian religion and humanistic ethics as well as in the philosophy of neovitalism, attitudes and formulae were adopted which aimed at simultaneously incorporating and denouncing scientific progress. It was realised that a denial of the successes of modern science and technology would be sheer obscurantism, but to the recognition of their merits the stipulation was added that higher cultural or spiritual values must always take precedence. This stipulation acted as a buffer against cultural adaptation to the evolution of science; science was tolerated or even welcomed, but as a handmaiden rather than as a master. This ambivalence of the European spirit when confronted with the rising tide of modern science, still pervades continental university life. The personnel and budgetary expansion of the natural, medical, and - more recently - also the social sciences is agreed to by the literary, theological and law facilities as a necessary evil, but never as a signal for change in the direction of development. Even medical faculty members themselves are apt to justify their claims by the apologetic statement that their disciplines just happen to require the expensive equipment in question.

Against this background, it becomes clear that the medical faculties in their present predicament may indeed be at the crossroads to alternative futures. Our traditional approach to teaching and learning in medical school is certainly consistent with the humanistic past of our European universities. These universities used to train doctors who knew their place in an orderly society, where the schoolmaster took care of educational problems and the priest or parson looked after spiritual welfare and family life, while the doctor was called in for deliveries and for somatic disease. They are not prepared, however, to train the adaptable physicians needed in a society in which the old roles and function are no longer appropriate. They are even less prepared to develop new approaches to the social as well as the physical ailments of this changing society. Finally, and most important, they are not prepared to recognise the present growth potential of science as the main opportunity for continued cultural evolution.

Moreover, this deficient sense of scientific responsibility is not confined to university staff members. Data on the matriculation performance of prospective students indicate that students with relatively low scientific abilities are attracted to the supposedly "soft" study of medicine or of the social sciences. This leads to a dangerous flooding of the life sciences with students who lack both the motivation and the mental equipment necessary for the continued advancement of these sciences. The political preoccupation of the most dynamic students similarly indicates that science is failing to inspire this generation.

It is clear that in this respect improvement cannot be booked at short notice and our only chance lies in an inspired and yet stubborn long-term policy.

4.2 Therapeutic requirements. We should realise, however, that time is short and the issue serious. The human phase of biological evolution has been characterised from the beginning by an adaptability which has surpassed that of any other organism, since it has depended on manipulation of the environment rather than on the biological mechanism of natural selection. This manipulatory potential, after gradual growth during many centuries, has now sprouted and flowered into the luxurious growth of today's science and technology. Our choice now is either to give priority to the further cultivation of these fruits of our evolution, or to foresake this historical responsibility and slide into some kind of modern Middle Ages. It is vain to hope that, as a third alternative, we could stabilise

at the level of present achievements. Our ecological, social and economical problems are mounting unrelentingly and can only be solved by deployment of all our scientific and technological resources. After all, no culture can expect to survive if it foresakes its most dynamic impulses.

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Stagnancy and subsequent decline are thus unavoidable, unless we put more effort into our scientific development. This general conclusion is of utter significance to the cause of medical education. At this point, I would like to return to the need for revised objectives for the training of future physicians (cf paragraph 2.2 and 3.2). How can our educational system serve to meet the urgent needs of our society and of our culture in general? How should we design our objectives in the light of these needs? Various groups of concerned educators have tried to answer such questions and in the field of medical education I would like to quote one effort which to me seems both inspiring and well-balanced. The following statement of objectives stems from the medical faculty of the University of Connecticut, which opened in 1968:

"1. to acquaint the student with the health needs of society and the role of the physician in meeting these needs;

2. to nourish a desire for quality in personal performance and in the goals set out for patient care and community health;

3. to foster attitudes which will create the patient-physician relationship that is necessary for effective patient care;

4. to assist the student to learn the knowledge and skills that are necessary for starting a professional career in medicine;

5. to provide an opportunity for the student to discover how his abilities can best be used to meet the needs of society;

6. to create an atmosphere of learning so that the student will have a desire, and will know how, to continue his education throughout his professional career."

All of these 6 points are of crucial importance to any programme for medical educational reform. The words "desire for quality", however, indicate what is most called for in our predicament as diagnosed above. Let me therefore finish by reviewing once more the general principles for change (3.2), keeping in mind this all-important need for quality in performance at all levels.

4.3 Specific prescriptions. To be able to "instill scientific attitudes and habits", the educational setting should be a centre of top-level learning and research. Since this can only be realised through concerted efforts using all available intellectual and material means, research projects in the medical centre should be few, vast and co-ordinated rather than many, minor and disseminated.

Specialisation of research programmes in medical centres, of course requires planning on a national scale to obviate waste of our resources as well as intolerable lacunae in our national research efforts. And this again leads to a third corollary: the need for reshufflement of the administrative structure of our universities. In this small country, the traditional local ties between faculties with widely different interests and objectives have long outlived their usefulness. For adequate planning, budgeting and administrating, a joint body of medical faculties would be utterly preferable, from a national point of view, than the present scattering of unco-ordinated operations in different universities. It would, moreover, open vast opportunities for educational as well as scientific co-operative projects serving our need for quality! This idea is at present being scrutinised at various academical and administrative levels and may lead to radical structural changes in the near future.

To prepare physicians for the "integrated health care system" which our society direly needs, the medical faculties should first help this system to take shape. Subsequently they should themselves become involved in more ways than their present role of providers of advanced medical care.

This means that the specialisation of the medical centre mentioned above, should be paralleled by a "generalisation" in other areas. Besides being centres of excellence in a few chosen subjects, they should deliver regular intramural care on a comparable scale and levels as other hospitals in the area. They should, moreover, function as a base for such extramural services as are relevant to the training of the future health personnel. It is clear, moreover, that this personnel includes various categories whose training needs integration just as badly as their future functioning. The medical faculty therefore will have to shoulder other educational responsibilities besides the training of physicians. In this respect, as in the provision of care mentioned above, the hallmark of quality will be the successful integration of the faculty in the national health care system as both a mirror and a model of this system.

This too is being tentatively discussed but requires considerable administrative change. Effective ways should be found for joining the responsibilities for medical training of the Ministries of Education and of National Health. Their administrative co-operation would further consist of both the research into, and the development of better systems of health services. It would also guarantee the integration of the educational and functional settings of all health personnel.

To improve the "process of interaction between students and teachers", the faculty should meet a large number of requirements which are at present only partly known. For instance, teachers should be better motivated and equipped for the task of guiding and inspiring their pupils. This means that courses of teacher-training should be a vital part of the academical career. Moreover, all educational efforts should be supervised and evaluated by responsible committees in which both students and professional educationalists have a major voice. A well equipped service for educational research and development is an indispensable part of the modern medical faculty.

It is evident, however, that more is needed than changes in the techniques of teaching and learning. Traditionally, our faculties are like a market where perhaps the vendors are acquainted or even friends with each other, and where each client may stroll or stumble at his own leisure and responsibility. Ideally, we should have a workshop where all, students and instructors, are inspired by a common goal and work together in a self-regulating community.

This leads me to a final remark on what is perhaps the most difficult component of our prescriptions. For didactic as well as social reasons, students should form an integrated part of the medical faculty. They should both be considered and consider themselves as partners or citizens in a teaching-learning community rather than as consumers in an educational supermarket.

However, traditional patterns of attitudes and reactions, as well as recent trends of administrative change, may be unfavourable to a development in this direction. In the past, student response to organisational changes aiming at increased participation has been low, and this seemed ascribable to a lack of interest rather than to disagreement with the proposed changes. Our recent reform, which involved setting up elected boards on which students as well as technical and scientific personnel are all represented at various levels of university management, has so far not improved this situation. In many cases the rift between traditional leaders, uncomfortably sharing their responsibilities and newly elected rulers who seem more attracted by general ideological issues than by the task of running the university has actually widened.

These may of course be transitional troubles in an era of change. On the other hand, it must be realised that the evolution of a truly responsible and

coherent community equipped to face the problems of today, will mean that many time-honoured continental ideas on the nature of the university will have to be abandoned. This will take many years, and it is doubtful whether there is still that much time left.

A P P E N D I X I I

Revised academical statutes for the study of medicine in the Netherlands

The following is a rough, unauthorised translation of the text and the official explanatory annotations of the Academical Statutes for the Study of Medicine, which have become effective as of October 1968. The texts are part of the total body of Academical Statutes which define the structure of all curricula on the level of university education in the Netherlands. The numbering of the articles is not included in this translation. Source: Staatsblad 500, Koninklijk Besluit van 8 oktober 1968.

Text:

- The "kandidaatsexamen" comprises:

  a. the scientific data concerning the structure and functions of man and concerning the development of these, including the general scientific background of these data.

  b. the introduction to the disturbances of structure, functions and development of man.

  c. the fundamentals of influences affecting structure, functions and development and of disturbances of these.

The "kandidaatsexamen" is taken in at least 2 parts, the first of which is the "propaedeutisch examen".

- The "doctoraalexamen" comprises:

the disturbances affecting structures, functions and development of man, and the ways and means to recognise and influence these disturbances.

- The "assistent-artsexamen" requires:

the knowledge and skills necessary for practising medicine.

To be admitted to the "assistent-artsexamen", the candidate should satisfy the faculty that he is sufficiently experienced in handling normal childbirth and in rendering medical aid in emergency cases.

- The "artsexamen" comprises:

the proficiency and fitness for the independent practice of medicine.

Explanatory annotations:

The present wording of the programmes for examinations in the faculty of medicine is principally different from that in the previous Academical Statutes. The development during the last decennia of the various sciences relevant to medicine and of their applications have rendered obsolete the previous list of requirements. Because of the continuing and rapid scientific development, moreover, any present list of disciplines or specialisms would in the future be equally unsatisfactory.

In the present developments of science, 2 tendencies may be discerned. On the one hand there is the increasing differentiation of concepts and techniques which forces each scientist to operate, as far as his own personal experience is concerned, on an increasingly small area of specialised knowledge, while an increasing number of

such areas of specialisation is being opened. On the other hand, however, there is an increasing convergance of various specialities on identical fundamental problems. This convergence, which occurs at the level of basic as well as of clinical sciences, results in an increasing interdependence and integration of disciplines and disappearance of boundaries.

Both these tendencies and the fact that medicine deals with man in all his physical and psychological aspects, render inadequate any explicit summing up of disciplines, necessary for medical education. Inadequate both vis-à-vis the increasing diversity of scientific approaches, and in regard to the increasing opportunities for synthesis and integration.

The new text therefore aims at a qualitative description of the area and the level on which medical education operates. Any more detailed elaboration of these descriptions, in terms of the disciplines in the curriculum and of the required levels of specific knowledge and experience, is based on the scientific and social situations and requirements of the present. Because of the major and rapid changes occurring during these days, it would be inopportune to formulate and fix such an elaboration in the Academical Statutes.

On the other hand, some indication of the way in which the general description of the Statutes should be detailed is of course necessary. For some time now in medical faculties, a reorientation concerning objectives and methods of education has started. In this process the following trends emerge. There is first a tendency to give man and medicine a more central place in the early phases of the curriculum. Next there is the tendency towards an earlier introduction into clinical medicine than was usual so far. Finally, there is the trend to train students to be responsible for medical decisions. These general trends have been directive in the following elaboration. Existing plans of faculties or curricular reform have also been incalculated.

The way in which the elements of the curriculum have been listed requires some explanation. Here too, it was mandatory not to obstruct future developments required by the evolution of science and society. Here too, it was thought no longer feasible to define medicine through a list of different disciplines as was done in the previous Academical Statutes. The following lists of elements for the curriculum, therefore enumerate areas of science and scientific experience on which the curriculum should be built. These areas are designated as the "pillars" or "columns" structuring the curriculum. <u>These columns should not be identified with chairs or with units for examination</u>. It is here that care should be taken to leave room for future development. Especially when the nomenclature of some columns is identical with that of traditional disciplines and units of examination, this difference in concept should be emphasised. Any list of existing chairs or specialities would be inadequate and would obstruct evolution. Taken as "pillars" or "columns", on the other hand, these lists may adequately define the scope of medical education.

This approach implies that, while the columns are the elements to be used in each curriculum, it is the responsibility of the faculty to detail its programme from these elements. For the examinations mentioned in the text, of course the requirements of different faculties should be comparable, as is obligatory under other articles of the total Academical Statutes. Faculties, however, have considerable freedom to split examinations and to define exemptions or additional requirements when students want to change from one faculty to the other.

<u>Annotations to the various articles</u>:

The curriculum for the "kandidaatsexamen" aims at an introduction to those sciences fundamental for understanding medicine and its development. The curriculum therefore is built on at least the following columns:

1. Macroscopical, microscopical, sub-microscopical and molecular structure and development of organisms, especially of man.

2. The functions of living organisms, including chemical and physical aspects;

3. Genetics;

4. Behavioural sciences;

5. Health science;

6. General pathology and the introduction to clinical sciences;

7. Pharmacology;

8. Microbiology.

A period of 3 years is advised for the curriculum for the "kandidaatsexamen", leaving intact the responsibility of the faculty in this respect.

At the end of the first year a "propaedeutisch examen" will be taken. Requirements for this examination will be defined by the faculty, but in general the columns 1 and 2 should be represented. This "propaedeutisch examen" may be defined as aiming at an introduction into the structure and functions of man and into the development of these. Introduction into other areas, such as columns 3, 4 and 6, may also be given.

This of course is in contrast with the previous Academical Statutes, which required physics, chemistry and biology as a separate course in natural sciences to precede the medical curriculum. The new text aims at integrating this introductory year into medical teaching. Physics, chemistry, biology and other sciences may be incorporated in this curriculum in variable ways.

In principle, each of the columns may be continued throughout the curriculum for the "kandidaatsexamen" or throughout the entire curriculum. The faculty decides at which phase a column is added to the curriculum. After the second year, an examination may be taken, which will then be part of the total "kandidaatsexamen".

The curriculum for the "doctoraalexamen" aims at an intelligent knowledge of the origin, the recognition, the prevention and the treatment of diseases in man. Furthermore, a start will be made with acquiring the skills required for the practice of medicine. The curriculum for the "doctoraalexamen" is built on at least the following columns:

9. Special nosology and pathological anatomy.

10. The diagnostics and therapeutics applied to diseases in man, with due regard to factors such as age or social and psychological circumstances.

11. The scope and indications for surgical procedures.

12. General and special obstetrics.

13. Psychopathology and the disturbances of human behaviour.

In the curriculum for the "doctoraalexamen", columns from the previous phase may be continued. This applies not only to the numbers 7 and 8, because it may be necessary to include elements from other areas, such as biochemistry, in the "doctoraal" curriculum. The columns numbered 4 and 5 similarly are continued in the "doctoraal" curriculum, but here emphasis now shifts to special medical aspects. Where teaching is integrated, of course all columns may be continued throughout the entire curriculum.

A period of 2 years is advised for the "doctoraal" curriculum, leaving intact the responsibility of the faculty in this respect. Part of the "doctoraalexamen" may be taken at the end of the 4th year.

It is pointed out that in the areas numbered 10, 11, 12 and 13 practical work may be organised. This would conform with the general principle to move elements from the previous 6th and 7th year towards earlier phases of the curriculum. In this way the change towards a 6 years curriculum does not so much lead to a shortened as well as to an intensified clinical curriculum.

The curriculum for "assistent-arts" in principle continues the columns specific for the "doctoraalexamen" (9, 10, 11, 12, 13). Emphasis, however, now shifts towards those aspects of knowledge and skills which are required for practical medicine. The objective of this phase of the curriculum is that the "assistent-arts" will be able to function as a physician, be it under supervision, and will as such have a limited responsibility. Besides, the "assistent-artsexamen" qualifies for medical careers which do not imply the independent practice of medicine.

Against this background, the columns which between the "doctoraal" and "assistent-artsexamen" are added to the curriculum, can be designated as follows:

14. The practical exercises of diagnosis and treatment of diseases of man, with due regard to the aspects mentioned under number 10.

15. The practical exercise of surgical diagnosis and indications for treatment.

16. The practical exercise of general obstetrics.

17. The practical exercise of diagnosis and treatment of psychological disturbances and of deviations of human behaviour.

A period of one year is advised for the curriculum between "doctoraalexamen" and "assistent-artsexamen", leaving intact the responsibility of the faculty in this respect. The elaboration of this, the 6th year, of the curriculum will vary in the different faculties. The objectives mentioned above may be realised along different pathways. Such differences, moreover, will be necessary because clinical and other facilities for training will not develop along a uniform pattern. Especially the number and the duration of clerkships, and also the distribution of clerkships over the phases of the curriculum, will have to be defined per faculty. The wording of the columns 14, 15, 16, 17 and also the way in which the columns from before the "doctoraalexamen" will be continued, and here especially number 4 is mentioned, leave room for variable arrangements.

The article concerning the required experience in handling childbirth etc relates to what has been explained above. Although the "assistent-arts" is not supposed to practice medicine independently, it is necessary that every medical man is capable of rendering medical help in certain circumstances. This requires a certain level of experience and skill. The present articles enable the faculties to fix their requirements in this respect and where necessary to provide for adequate training facilities.

The curriculum for the "artsexamen" aims at preparing the "assistent-arts" for bearing a doctor's full responsibility. The curriculum therefore will have to provide occasion for the development of qualities such as accuracy, sense of responsibility, insight into the effects of medical treatment and non-treatment. Because of the rapid and differentiating development of medical specialities, a curriculum aiming at all-round medical knowledge and skills is neither desirable nor possible. On the basis of the knowledge and experience required for the "assistent-artsexamen", however, it is feasible to prepare this "assistent-arts" for the independent practice of medicine by an additional training in some facets or parts of medicine.

For this additional training a period of one year is advised, during which time the "assistent-arts" will be employed in hospitals and/or other institutes of health care. Part of this period can be spent in general practice or in laboratories. Because of the development of medical specialities, the faculty may offer differentiated training programmes. Specific training for general practice will be one of these. Besides, alternative possibilities will be offered, preparing for or making a

start with further specialised training or training for research. Each of the programmes offered, however, will also be aimed at the objective mentioned above.

The programme described above for the "artsexaxem", leads to the following completion of the list of columns:

18. Training aimed at cultivating the fitness for the independent practice of medicine.

19. Further knowledge, insight, experience and skills, to be acquired in the framework of the chosen training programme.

The way in which the artsexamen will be taken, will be detailed by the faculty. On the basis of other articles of the Academical Statutes, this examination may be divided in 2 or more parts and exemptions may be granted.

In connection with the concept of "fitness for the independent practice of medicine", the following consideration may be added. During the 7th year of the curriculum, this fitness for independent practice should be evaluated in terms of amongst others accuracy and sense of responsibility. An evaluation of the relevant qualities should play a part in the "artsexamen".

NB This rough translation should not be used for verbatim quotation.

C H A P T E R V

SPAIN

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1. INTRODUCTION

Recent progress in medicine has made existing teaching systems anachronistic, especially in countries which have highly traditional universities and have therefore not yet been able to set up machinery lending a certain flexibility to curricula and making them adaptable to the requirements of constant change.

The revolt by students and their increasing participation, together with the teachers, in the intrinsic problems of the university have made this anachronism more evident and today we are keenly aware of the urgent need for certain changes which were proposed in Spain some years ago, although admittedly somewhat timidly.

Thus, there have been continued discussions during the last years at public and private meetings on the problems involved in the teaching of medicine - at all levels and in all subjects. The promulgation of a new Education Act together with the setting up of new autonomous faculties will permit experiments in medical education. We can therefore look to the future with optimism, assured as we are, for the first time, of a hearing in academic circles for the different new concepts which are gradually penetrating into the minds of most of us. Today an increasing number of people are aware of these problems and are studying possible solutions as part of the research recently started in the departments of medical education - which have just been set up - and in educational science institutes.

Hence, although we cannot claim to be in the revolutionary vanguard with respect to the teaching of medicine, a period of evolution has nevertheless begun.

2. THE PRESENT SYSTEM

2.1 Admission. The average age of entry is between 16 and 18 years and students must have completed 6 years of secondary education and one year's pre-university study.

Under the present system there was no prior entrance selection up to 1970, but already a number of faculties are regarding the first year as being of a selective character. Only the University of Navarra made a selection by means of an entrance examination, sometimes accompanied by an interview. So far, there has never been any restriction on the number of places in any of the faculties.

2.2 Duration of study. The course lasts 6 years. There is no clear division into stages, but the so-called basic subjects occupy the first 2 years and part of the third, and clinical training the rest.

The curriculum is based on the system of independent chairs. There is no co-ordination between the syllabuses for the different subjects, and still less integration, with the purpose of avoiding unnecessary repetition. There is no central core of principal subjects with other subsidiary ones, since each chair seeks to make its subject as important as possible; this sometimes leads to a serious lack of balance in the theoretical subjects because the instruction given

in several of them is too specialised for undergraduate level.

In recent years in Navarra, serious attempts have been made to co-ordinate basic curricula. Owing to the shortage of hospital beds available locally for purposes of clinical instruction, series of optional subjects and clinical courses have been introduced making it possible to use numerous hospitals without special prior authorisation. There is some confusion with respect to the names given to courses and the timetables of students during their clinical training period. Some of them "win" posts as resident medical students in certain hospital departments by competitive examinations, and this guarantees them some experience in contact with the patients. But this apparent advantage is offset by the fact that the student remains attached to the department concerned for several years, normally those of the clinical training period, and this interferes with his regular participation in other activities included in the curriculum, particularly further periods of clinical experience in different departments. The faculties have not yet organised a compulsory system of resident medical training in hospitals for all students in rotation, hence the serious gaps in some aspects of their training.

2.3 Examinations. In view of the large number of students, their knowledge is tested mainly by means of theoretical, and sometimes theoretical-practical examinations, which the student can re-sit up to 5 times if he fails.

Partial examinations are held in the different subjects throughout the course to assess the students' regular work, but qualification depends on the final examinations.

2.4 Degrees. Completion of the 6 year course, without a period of hospital training, qualifies the student for the title of Bachelor of Medicine and Surgery. At least 10% of the total number of students attend a number of supplementary courses and write a doctorate thesis under the supervision of a university professor, whereupon they are awarded the title of Doctor of Medicine, which, as a rule, is required only of those who wish to enter the teaching profession. The university does not award an intermediate degree such as that of Master, and the Doctorate does not correspond to the academic requirements of an Anglo-Saxon PhD.

Knowledge is tested and the final assessment made by means of examinations which differ in form according to the subjects, but which are not organised scientifically to measure the benefit derived from a syllabus or the attainment of certain teaching aims. In most subjects the examinations are oral, but there are many variants, including examinations based on multiple choice questions. In the case of certain more specialised subjects, examination results are analysed by computer.

2.5 Postgraduate training. With respect to supplementary training, only the University of Madrid requires, in its latest study plan, a year's resident clinical practice, for which the necessary preparations have not yet been made in its teaching hospital. Other non-university hospitals offer practical clinical training and specialist courses under the residence system, which is not yet compulsory, although attempts are being made to make it so. As a rule, many of the graduates spend their period of residence in non-university hospitals.

The title of Bachelor of Medicine and Surgery, which legally authorises the exercise of the profession in any of its branches, permits the holder to practise freely. For reasons of professional ethics, most doctors attend further training courses; under the regulations governing these, only a certificate attesting that the holder has spent at least 2 years in a specialised hospital department is required for the award of a specialist diploma. A number of moves by different groups are aimed at bringing this rather out-moded and inefficient training system up to date.

3. REFORMS OF AIMS

A study of the course programmes of the Spanish faculties of medicine reveals that none of them refers to precise aims. That is why it is difficult to speak of "reforms" of aims. Nevertheless, in the reports of recent meetings and in certain proposed new study plans, specific mention is made of the aims to be achieved at each level of a doctor's training.

That is why in Toledo, where Spanish experts and foreign consultants met, it was agreed that the main aim of the faculty should be to train general practitioners; stress was laid, however, on the need for certain restrictions on their right to exercise their profession. The same approach to this subject is adopted in some more recent studies and it seems clear that, in marked contrast to the "omni-competence" conferred on the title by the law, a less optimistic attitude is taken today. Recent graduates are required to undergo hospital training under the traditional residence system before receiving their diploma, which will in future qualify them to be general practitioners only.

The new plans provide for direct contact between the future doctor and the patient in a basic training centre, ie a teaching hospital. They reject premature specialisation and consider that every doctor should have a basic training as a general practitioner before specialising.

The only apparent exception is the possibility of concentrating at an early stage on the basic sciences, but we see no contradiction in this, since the aim here is to encourage students not to specialise early but to go in for research and teaching and to select topics for their doctorate from such subjects at the end of the third year of study, while following the syllabus laid down for each of the special subjects chosen.

It is felt that the shortage of teachers in basic sciences makes it necessary to cut short certain medical careers if students reveal aptitudes for research and teaching.

A notable innovation in the aims of these new plans is the more important place given to social and preventive medicine which require a humanist doctor aware of social problems. If the student takes part in research work on social medicine, in the compiling of statistics and in a certain type of enquiry in the field of health, as well as in series of round tables at which questions concerning everyday medical life, the exercise of the profession, health legislation and its problems etc are discussed, he will become familiar with certain aspects of the profession which, previously, he tended to discover only when he met them in his work.

Another important element introduced into this new form of training is the participation of the student in the analysis of problems connected with the teaching of medicine, so that he can see and understand the reasons for a number of changes which are taking place around him and become aware of his role in determining such changes.

4. CHANGES IN ENTRANCE CONDITIONS

Although the new conditions laid down in the present Education Act do not include an express numerus clausus, machinery is established to permit a selection of students, the main aim of which is to guarantee the success of their studies.

The main change is the division of studies into 3 stages: the first for the development of basic knowledge, the second, for specialised training for each profession - at the end of which the students will obtain, in medicine, the title of Bachelor - and the third, for postgraduate professional specialisation which will qualify him to teach or do research, and at the end of which he will receive the title of doctor.

Admission to university studies is conditional on the completion of an introductory course which replaces the one year pre-university course (PREU), after which the faculties can use the selection method of their choice. In faculties where this system is already being practised, the main means of selection are: a study of the student's school record, particular attention being paid to his knowledge of mathematics, physics, chemistry and biology and, in general, to the aptitudes he has shown throughout his school career as compared to the average standard of his fellow pupils; some faculties have an entrance examination and others interview borderline candidates after the initial selection has been made.

The general opinion is that there is little advantage to be gained by increasing the number of selective examinations and that these add to the student's feeling of insecurity.

Most faculties make their first year of general studies one of selection and therefore, in some of them, the course is described as "selective". The general tendency is to admit to this course - which takes place in the science faculties and is common to several branches of study - a larger number of students than the faculty can cater for, since for various reasons: lack of motivation, failure to adapt, lack of maturity etc, the rate of failure is fairly considerable. Thus selection is effected on the basis of quality, and the number of those who continue their studies is fixed at the end of the first year of general studies. The new autonomous faculties have restricted the number of students who can be admitted to the first year course to 150, since they feel that this figure will reduce "student mortality" to a minimum or keep it within reasonable bounds.

Another important change in entrance criteria is that concerning the numerous foreign candidates. Spanish universities, mainly for political reasons, have prided themselves on keeping their doors permanently open to Latin American and Arab students. Particularly in medicine, such students have always represented a considerable percentage of the student population. Under new measures, the university doors are not closed, but Latin American students are subject to the same conditions as have been introduced for Spaniards, ie completion of pre-university studies and the selection course in sciences; while Arab students, too, must fulfil the entrance requirements and also furnish evidence of an adequate knowledge of Spanish. The system applied to students from North America, whose number has increased inordinately in recent years, is the same as that in force in their country of origin, the aim being to make the Spanish system less attractive, for the excessive facilities it afforded not so long ago increased student overcrowding and led to a lowering of teaching standards. That, together with greater strictness in permitting transfers by students who fail in one centre and seek better conditions in others will undoubtedly mean that, in a fairly short time, the faculties of medicine will have a number of students in keeping with their training facilities.

5. REFORMS OF CURRICULA AND TEACHING METHODS

The idea of a change in the teaching of medicine is, like the legal measures to implement it (July 1970), so recent that little can be said about what actually exists. It is realised that there will be all sorts of difficulties in implementing changes which, although they have already been carried out in other countries, are still regarded as heresies in ours. Nevertheless, some progress has been made and a change of attitude is taking place. Therefore it is permissible to assume that it will be possible to regard the new autonomous faculties as experimental centres where new pedagogic concepts will be applied.

No very precise ideas have been worked out with respect to health team training and that is why, so far, no faculty has introduced interprofessional training curricula. The sole innovation is the training, in a single centre and in certain joint courses, of nursing staff, nursing assistants and medical technicians in the various branches, but only in a very limited way.

The introduction of departments and institutes will make it possible to train students from various branches of study in pre-clinical subjects for which teachers are in short supply and must be made maximum use of. An attempt is being made to provide a common course in the first years for several branches of study: the subjects taught in these joint classes, which are all given in the faculties of science, are mathematics, chemistry, physics, biology and other selected subjects. The pre-clinical and clinical stages are clearly distinguished and, in both cases, students take an active part in laboratory work, which is normally multidisciplinary, in seminars, round tables etc, the number of formal lectures being restricted to a minimum. The student is brought into contact with the teaching hospital at an early stage and measures have been taken to ensure the availability of an adequate number of beds for teaching purposes, so as to guarantee all students an adequate clinical course (clerkship) and, later, a period of residence in a hospital.

The new Faculty of Medicine at the autonomous University of Madrid has 3 affiliated hospitals for that purpose: Clinica Puerta de Hierro, Ciudad Sanitaria La Paz and the Jimenez Diaz Foundation, with a total of 3,600 beds. These institutions are extremely well equipped and all have full-time medical staff. The recent agreement at national level between the Ministry of Education and the Social Security makes it possible to increase the number of teaching beds according to the needs of each faculty.

With respect to subjects taught, the new study plans attach particular importance to social and preventive medicine, which is studied throughout the whole course and is intended to make the student aware of social problems. An introduction to ecology and socio-anthropology is given in the first year. These subjects are subsequently to be found in the integrated curricula dealing with the epidemiological and preventive aspects of disease, industrial medicine, and the elements of hospital administration and health organisation etc.

It is difficult to talk of "subjects", in connection with the new type of programme, now that the tendency is towards integrated teaching which presupposes larger departments and systematic instruction. That does not mean that the plan to introduce integrated teaching will be accepted automatically by all. There will still be a great deal of discussion on the subject and in reality, the situation is still the same as it has been in recent years. The system of chairs without any integration or co-ordination is still being practised, with this one difference, that certain faculties have introduced the "department" concept, but the content of this innovation is, in fact, far from being what is claimed.

In general, the traditional faculties continue to use lectures as the main method of teaching. Nevertheless, several centres are progressively introducing audio-visual media, films, film-strips, projections during lectures and closed-circuit TV for demonstrations to large groups.

Programmed teaching and teaching machines have not been used in practice, but they are much discussed at meetings and seminars where stress is laid on their usefulness in faculties which have a large number of students.

A start has been made to use computers to analyse examination results. But there is no question yet of their being used for educational purposes. Moreover, not enough experiments have yet been made with these machines and for the moment, more confidence is placed in instruction at the patient's bedside - regarded as a fundamental element in teaching - than in simulated cases and teaching directed by computer. There is more curiosity than conviction in the desire to experiment with systems with which teachers have become acquainted only through the medical literature.

Perhaps these machines will play a very important part in the future in training teachers in new methods and introducing them to their profession as teachers. The autonomous University of Madrid has introduced an intensive course in its department of medicine for all staff of the recently affiliated teaching hospitals who will be expected to take part and collaborate in teaching. In this course, future teachers

are given an explanation of the philosophy of integrated curricula, the function each of them has to play, the techniques for assessing the student's work and the systems for testing knowledge during the course. An analysis will also be made, with all teachers at the various levels, of the details of curriculum planning so that each of the teaching hospitals may work on the same lines whilst preserving its academic freedom, and endeavouring to achieve the aim it has set itself. This intensive course is used to define these aims and to determine the means of achieving them.

6. EXAMINATION AND KNOWLEDGE-TESTING METHODS

Under the Education Act, Spanish faculties award only the 2 traditional titles: Bachelor of Medicine and Surgery, and Doctor; the traditional conditions of their award are well known. But in the new study plans, provision is made for doctorates in basic sciences, which do not require the holder to complete the full medical course, not to mention the award of intermediate or additional titles besides the doctorate.

It is considered that one of the fundamental changes made by this Act is that concerning the assessment of the student's achievements, which must take into account not only knowledge acquired by him, but also the extent to which the aims which the faculty has set itself have been achieved.

In all the Spanish faculties the examination is the essential element upon which judgements are based. We believe that, while this attitude prevails, any changes in plans and teaching methods will remain a dead letter, since the student will continue to consider that his main duty at the university is not to learn but to pass examinations.

Clearly, in order to control the number and quality of the students, there has been an attempt in several centres to implement a system of guided work and to establish satisfactory teacher-student relationships. In these programmes a personal knowledge of work carried out must take precedence over the results of any written or oral examinations. We have seen integrated programmes put into practice, but they included separate examinations for each subject and that had harmful psychological effects on the student, which cancelled out all the benefits which planned education might have afforded.

In integrated courses there must, in our view, be integrated examinations, held at appropriate intervals so that they do not interfere with teaching. For a certain period the student would take these examinations, but ever closer contacts between the teacher and the student would gradually diminish their importance. Nevertheless, this is far from being the case at present.

Considerable progress has already been made thanks to the introduction of objective multiple-question examinations, and especially by taking into consideration the student's own work. The obligation, laid on the departments of medical education should be extended to all faculties, namely: to collaborate with teachers in order to define appropriate systems, permitting an assessment of the student, the teacher, the teaching methods etc. Only thus will we be able to establish criteria enabling us to arrive at useful conclusions.

7. ORGANISATION AND LOCATION OF MEDICAL FACULTIES

For a population of slightly over 32 million, whose growth rate is not very high mainly because of the considerable amount of emigration, there were 10 faculties of medicine in Spain up to a short time ago. They were all public and came directly under the Ministry of Education and Science.

Subsequently, authorisation was given to set up the only private faculty of medicine existing in the country. Situated at Pamplona, it was originally academically

linked with the University of Saragossa. But today it has all the attributes of an independent university and enjoys financial support from the religious organisation "Opus Dei".

Recently (1968), 6 new faculties were set up, 3 of them autonomous and situated in Madrid, Barcelona and Bilbao. They will begin their fifth year of medical teaching in the academic year 1972-73. The 3 others are in Oviedo, Murcia and La Laguna (Canary Isles) and are attached to the state universities in those towns.

Thus there are now 17 faculties of medicine which, thanks to a better regional distribution of students and to more adequate selection methods, will be able to provide instruction adapted to the present number of students, without over-large classes and with a more normal teacher-student ratio.

What has perhaps done most to improve the situation in medical teaching are the measures adopted by certain faculties with regard to foreign students - mainly those from Latin America and the Arab countries - whereby such students are subject to the same entrance conditions as Spanish students - general studies or PREU - and are required to have an adequate knowledge of the Spanish language. The same selection criteria are applied to them as those being progressively introduced in most faculties. Within a short time we shall have information enabling us to judge the effects of these measures on a student population which, in some years has exceeded 6,000.

The most important factor in the basic improvement of teaching, especially clinical instruction, is the use, for teaching purposes, of hospitals which are not attached to the university. At the beginning of 1970 an agreement was signed between the Ministry of Education and the Social Security (National Insurance Institute) under which the new Faculty of Medicine at the autonomous University of Madrid could use the 2 main hospitals that the latter has in the Spanish capital (Clinica Puerta de Hierro and Ciudad Sanitaria La Paz) as teaching hospitals. This seemed such a sensible measure that, a few months after the agreement was signed, it was extended to national level by the setting up of machinery enabling all medical faculties to use the Social Security's existing hospitals in towns where there are faculties. Later a further agreement was signed which attached the "Clinica de la Concepcion", belonging to the Jimenez Diaz Foundation, to the autonomous faculty of Madrid. The clinic is a private hospital of high repute which provides 750 additional beds (hitherto there had been 2,800 teaching beds) thus making it possible to offer supervised clinical experience to all students both at the undergraduate level and during their period of residence in hospitals.

Some Spanish regions have carried out important studies on hospital regionalisation and it should be noted that the university teaching hospital is a central element in the regionalisation plan which, by embracing the peripheral centres, will enable them to be used for practical instruction for students in rural areas.

Some autonomous universities have arranged for the affiliation, for teaching purposes, of institutions which, although not part of the university system, afford opportunities for teaching, in the form of practical laboratory exercises or specialised clinical experiments. Examples include the National Virology Centre and certain psychiatric institutions coming under the General Health Directorate, and other centres which formerly engaged exclusively in research, such as certain institutes of the Supreme Council for Scientific Research.

In short, there is a tendency to avoid needless expenditure and to use to the maximum all available material facilities to train medical staff. Thus the new faculties of medicine are beginning to form associations with nursing schools and schools for training technicians in the various branches. All these are attached to the teaching hospital. The aim of these new faculties is to serve as pilot centres for the introduction of new teaching methods, such as common curricula for different branches of study permitting early contact between members of the different health services.

C H A P T E R V I

SWEDEN

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1. PRESENT SYSTEM

The present system is based on the medical education programme enacted by parliament ("Riksdagen") in 1969, which has superseded the former system based on the 1954 programme. The new system contains a shorter undergraduate training and a longer and more systematic postgraduate training to specialist certification than the earlier system.

1.1 School education and age of admission. The primary school, which is common for all children, comprises 9 years from the age of 7 years to 16. Then follows the optional secondary school ("gymnasium") with several parallel "lines". A future medical student preferably, but not unconditionally, should choose the "natural-science" line which lasts for 3 years. As a rule, the medical student will therefore be 19 years of age at the time of admission to medical studies.

At the "gymnasium" school, the pupil is graded in each of the subjects by a relative 1 - 5 scale with the following nation-average distribution: 7% grade 1, 24% grade 2, 38% grade 3, 24% grade 4, and 7% grade 5 (the highest grade). The average of a single school class is adjusted by the use of centrally produced tests in certain subjects.

1.2 Methods of admission. There is a numerus clausus for the admission to medical studies, leading to the university medical degree. In Swedish, the latter is formally called "Läkarexamen", ie "physician's examination" where the term "physician" represents all medical graduates. The admission occurs twice a year, or once per academic term, viz on 1 September and 20 January. For the 6 medical faculties this amounted to 956 students during the academic year 1969-70 (see Table 1). The admissions are expected to increase to around 1,050 within a few years. About 30% of the students are women; this proportion has been relatively unchanged during the last few decades. Admissions have increased considerably during recent years. Hence, the number of physicians, expressed as number of persons with full professional activity, which amounted to about 6,400 in 1960 (one physician per 1,070 inhabitants) is expected to reach 19,000 in 1980 (one per 440 inhabitants).

For basic competence to be accepted for medical studies, a school pupil should have passed a "gymnasium" line with a grade average of at least 2.3 in all subjects, and at least a grade 2 in biology, mathematics, physics and chemistry on the natural science line. However, in practice, a very high grade is required for admission. Thus, for the autumn term of 1969 there were 2,523 applications to 478 places, and the average grade of the students accepted was 4.73 or higher. This was the highest grade level for acceptance in all the numerus clausus academic education lines. Academic studies in other fields are at present counted as an additional merit according to a specified list. The competence rules have been slightly changed in 1972, and since 1969 there is a "free" quotient of 15% admissions on subjective criteria (such as valuable professional experience) decided centrally.

Table 1 - Medical faculties and teaching hospitals in Sweden during the academic year 1969-70

The teaching hospitals usually have a large out-patient service which is also used for teaching purposes. Further, the main teaching hospitals are usually also "regional hospitals" within the national health organisation. A regional hospital receives special or difficult cases from all the "central hospitals" and "county hospitals" etc in its region. There are 7 regions, each with about 1.2 million inhabitants.

University	Student admission per year 1969-70	Teaching hospital	No. of beds
Göteborg University	168	Sahlgrenska sjukhuset	2,198
		Östra sjukhuset (under construction)	2,000
Linköping University College (1)	86	Regionsjukhuset	1,522
Lund University	190	Lasarettet, Lund	1,667
		Allmänna sjukhuset, Malmö	1,850
Stockholm, Karolinska Institutet	320	Karolinska sjukhuset	1,700
		Serafimerlasarettet	327
		Huddinge sjukhus (under construction)	1,600
		St. Görans sjukhus (2)	1,087
		Södersjukhuset (2)	1,600
		Centrallasarettet (2), Danderyd	919
		Roslagstulls sjukhus (2)	414
Umeå University	82	Lasarettet	1,117
Uppsala University (1)	110	Akademiska sjukhuset	1,381
Total	956		19,382

(1) The 86 Linköping students receive their first 2 years education in Uppsala.

(2) Used partly for teaching.

1.3 Duration of undergraduate study course. The total duration of the undergraduate study course - according to the programme of 1969 - is 5.5 years, ie 11 terms of usually 20 weeks each. The total study is divided into a pre-clinical period (terms 1 - 4), a propedeutic period (terms 5 - 6), a clinical first period (terms 7 - 8) and a second period (terms 9 - 11). This is further described in Appendix 1.

1.4 Components of undergraduate study course. The total study and its periods are built up of different subjects, and the teaching is organised mainly into successive, or parallel, subject courses according to the block principle (Appendix 1). There is, however, considerable integration between parallel or successive subjects, especially in the clinical periods. In the majority of subjects, there are repeated "course examinations" - perhaps every second week or so, usually oral - with the object of giving feedback, teacher contact, student self-evaluation, stimulation and motivation.

At the end of each course there is a final examination. The final examination in larger subjects for the compulsory level of "pass" is graded - from a lowest grade of 1 to a highest grade of 2.5 - but in smaller subjects it is ungraded. The grade given at the final examination is often based also on a consideration of the results of preceding course examinations. The level of "excellent" (grade 3) requires an advanced study course of approximately one term's duration in the respective subject, but is elective.

1.5 Name and kind of diplomas. Medical studies first lead to the degree of Bachelor of Medicine ("Medicine kandidat"), given after the successful completion of the pre-clinical period (2 years), and finally to the medical degree ("Läkarexamen"), given after the completion of the second clinical period (a total of 5.5 years).

Before the 1969 reform of the medical education programme the final medical degree was called Licentiate of Medicine and included 6.5 years of study. This corresponded essentially to the present programme plus 9 months of rotating internship, mostly outside the university, with final university examinations in surgery and medicine.

During the last few decades, about 95% of the students admitted have completed their studies. Moreover approximately 20-30% of the medical graduates also carried through the relatively large scientific investigation which until 1969 constituted the only requisite for the degree of Doctor of Medicine. Such an investigation usually took 3-6 years to complete, was reported as a single thesis or as a collection of shorter papers in scientific journals and publicly defended in a doctoral dissertation.

From 1969 additional course studies and the report of a scientific investigation - slightly smaller in size than hitherto, but of unchanged quality - are required for the scientific degree of Doctor of Medicine. It remains to be seen whether the new doctoral system will receive sufficient addition of resources to allow an increase of the scientific education in proportion to the increased admission of medical students.

1.6 Evaluation methods. Both written and oral examinations, either alone or in combination, are commonly used as final tests. The choice of evaluation method is usually left to the examiner. A practical test is usually not included in final examinations, but the student's practical performance during a course is always judged, and must be satisfactory. A student is not allowed to enter the final examination in a subject unless his course performance is acceptable.

The written tests often include both questions with multiple choice answers (for automatic processing) and questions with open answers, short or long. For grading of examinations, see Appendix 1.

1.7 Postgraduate training. The postgraduate training starts with a "general service period" (AT) of 1 year 9 months and continues with a specialist training period which includes some systematic studies and teaching. It is generally recognised that personal development, experience studies and contacts etc, are the most important factors for the postgraduate development of clinical skills. The advice of more experienced colleagues and control of the quality of the rendered medical service are also necessary for this development. It is, however, also generally acknowledged that an organised part of the postgraduate training,

including some form of evaluation, must be included. The medical education programme of 1969 introduced the requirement of systematic studies within the whole field of the subject (or subjects) in which a specialist certificate (or general practitioner certificate) is required.

The studies are usually divided into 6 parts during the 3-4 years of main clinical service in the speciality. Each part is concluded by a week-long course which includes teaching and an examination. A course usually has about 15-25 participants, and is organised by the National Committee of Postgraduate Medical Education ("Nämnden för Läkares Vidareutbildning", NLV) in one of the large hospitals. When the system is fully developed, more than 300 courses will be given annually. The NLV has a series of speciality groups with subject experts who give advice on the objectives, contents and practical arrangements of such courses, and also 3 sub-committees for education, examination, and certification respectively.

A similar system for undergraduate, as well as postgraduate, medical education exists in the other Nordic countries, and there is a common Nordic market for the employment of medical graduates and specialists.

1.8 Central organisation of undergraduate medical education. Almost all Swedish universities and university colleges take central directives from the University Chancellor's Office ("Universitetskanslersämbetet", UKÄ) in Stockholm. Decisions on resources and most regulations are made by "Riksdagen", the government or the UKÄ. Thus, the admission of students, the medical curriculum, the teaching programme in each subject (with the definition of objectives, studies and teaching as well as practical work) are centrally directed and identical for all medical faculties. One important advantage of this system is the apparently similar quality of the education in different faculties and the increased possibilities for using centrally produced study material, films and TV programmes etc. The system also favours an even standard in the hospital service in different parts of the country. On the other hand, a disadvantage is that it becomes difficult for the individual medical faculty to make educational experiments or to redistribute resources according to rapid changes in need.

2. REFORMS IN TERMS OF OBJECTIVES

In general, the aim of medical undergraduate education depends on, firstly, the student's quality and initial knowledge ("initial behaviour") and, secondly, the necessary knowledge, skill, experience and personality function etc for graduation ("terminal behaviour").

The model terminal behaviour - identical with the initial behaviour in the compulsory postgraduate medical education - must take into consideration 2 principal needs in a medical graduate:

1. the graduate should have certain knowledge and skill, be able to perform the necessary daily routine work during the "general service period" and be prepared for the later "specialist (or general practitioner) training period", ie the education should satisfy the vocational needs;

2. the graduate should possess a general knowledge of man, society and nature, the knowledge of scientific methods and reasoning, and the capacity of personal development which are required in future society, ie the education should also satisfy the needs of a research and development function oriented towards man and society. This is difficult from several points of view because: too little is known concerning today's daily routine function in medical care, the rate of change is rapid both for the possibilities of medicine and for the needs of society, and the educational principles for an optimal research and development training are not well known.

During recent years in Sweden, the tendency in the discussion on the "direction" of medical education has been to point more towards the needs of the patient, of society and of prevention. The attempted level has not been defined and the acquired level is not well known.

The general aim of medical education has been formulated as follows in the new programme of 1969 (the aim of the 1954 medical programme was essentially identical): "The medical undergraduate education should give such knowledge and skill as is of scientific and practical importance for all physicians, and is needed as a basis for their postgraduate training". This definition allows both a positive and a negative identification of the direction but gives no information about the desired minimum or average level.

The further aims are formulated as follows: "The medical postgraduate training (continued education up to speciality certification) should give the physician the competence to function with independent responsibility within a special medical field. The medical refresher training - continued education after speciality certification - should give each physician the opportunity to keep and develop his knowledge in pace with the development of medicine".

It has been generally recognised that, in addition to these general aims, detailed objectives must be worked out by the teachers for each undergraduate subject; and to accomplish this, co-operation between subject representatives of different medical faculties in the Nordic countries has been started. In this co-operation, detailed goals and material for objective examinations are usually worked out simultaneously - as they are closely correlated - and undergraduate and postgraduate educational programmes are regarded as an uninterrupted unit.

The practical and vocational needs depend greatly on the organisation of work in hospitals and in health and welfare centres. The increasing need for a specialised function can be satisfied in alternative ways, eg by further "specialisation" of the medical graduates, by "branching" of the undergraduate medical education or by the creation of new "paramedical professions". This is an important strategical problem.

At present, the undergraduate medical education and the general service period - lasting 7 years and 3 months - are identical for all physicians. Then follows specialisation into the general practitioner line and the 13 main speciality groups (with a total of 40 specialities). An even more differentiated medical specialisation would probably require an early division into 2 or 3 main medical "branches" during the undergraduate programme, eg after 4 years of study; such a development has been discussed, but hitherto not accepted. Instead, many new "paramedical" professions have been introduced to satisfy the practical needs of the medical health service, as shown in Appendix 2. A similar tendency is seen in pharmacy, dentistry and the welfare professions.

3. REFORMS OF ADMISSION

The conditions of admission to higher education - eg competence, grading, numerus clausus, entrance testing - have recently been investigated by a national committee. The basic idea of the committee is to give more equal opportunities for potential applicants, which is expected to produce a greater variation in type of background education among those admitted. The committee also proposes to introduce prognostically more valid methods of selection. This, then, will give more weight to practical experience and performance and less to "artificial" theoretical merits such as reading extra subjects. These proposals have in principle been accepted by the "Riksdag" in 1972.

The trends concerning medical education are the following. The former tendency to extra academic studies, used only as a merit to be accepted for medical studies, is counteracted by reducing its merit value. This means that the "gymnasium" school grade becomes more important and that admission to medical studies tends to become an all-or-none affair at an early age. This system has the advantage that the production

of physicians becomes more "effective", ie in relation to cost and time. On the other hand, it reduces the possibilities for a student with a high motivation but too low school grades. There are also drawbacks, from the point of principle, as the school grade has but limited diagnostic and prognostic value - especially concerning personality development and creativity.

Entrance tests, psychological tests, or teachers' interviews are not used at present or planned to be used within the near future. It is, however, hoped that entrance personality tests will be more developed and they may then be used - in addition to school grades and measures of practical performance in a health-care profession - to fill at least a proportion of the places.

The grades in different school subjects are now averaged with equal weight, independent of the type or size of subject or the degree of objectivity of its examination, while formerly certain subjects were given increased weight (eg mathematics, physics, chemistry, biology, languages). The grade in physical education is also included but only if it is above the average of the other subjects; the same applies to subjects which are concluded before the last "gymnasium" year. The system of equal weight per subject was proposed for reasons of principle, ie in order to demonstrate that all school subjects are equally important and to exclude a harmful feedback effect. It was also believed that there is such a high correlation between subject grades for the single pupil that the ranking is very little influenced by the change to equal weights. The situation is different, however, when the admission level is very high and, consequently, there is considerable restriction of variation. Thus, it is not probable that a difference from 5.00 to 4.70 in average school grade would have much diagnostic validity.

There does not exist any detailed investigation in Sweden on the prognostic value of previous school grades for success in the medical studies or the medical career. However, the conditions of admission to medical studies are generally regarded as unsatisfactory, but no method has hitherto been proved, or believed, to have a better diagnostic or prognostic value than the school grades. The present system will be difficult to evaluate, as there is restriction of range of school grades, as gradation in subject examinations in the undergraduate studies is stereotyped - at least concerning clinical subjects - and as it is difficult to define a valid principle to evaluate and grade a physician's function.

One type of criticism of the present admission system has suggested that high "gymnasium" grades tend to correlate with a too scientific and technical - and perhaps inhuman - attitude towards patients, in the physician. This is only an unproven hypothesis, however, as there is not any evidence that average or low school grades would correlate better than high grades with some index of excellence in a physician's attitudes, behaviour or function. It is the interest in human care, the orientation towards patient's health and welfare and society's needs, and the physician's basic motivation to help and heal, which among other qualities, are most desired in physicians.

Such an aptitude is difficult to evaluate in a young student, however. Since a better prognostic instrument than school grades cannot be theoretically demonstrated at present, a practical experiment is being performed, as mentioned earlier. Thus, a proportion of 15% of the medical students are accepted by new admission criteria, for example on the basis of a period of well qualified work in another health profession.

4. REFORMS OF CURRICULUM AND TEACHING METHODS

The new medical education programme of 1969 underlines the importance of integrated teaching. Integration may be practised as "horizontal integration" between subjects studied in parallel at a certain stage or as "vertical integration" between subjects of different stages, eg anatomy and diagnostic radiology. The integration is left mainly to the faculties, and is planned by collaboration of individual teachers or by the faculty's educational board (which has the local right of decision in all problems of education).

Diagnostic disciplines such as clinical chemistry, clinical microbiology, clinical pathology (post-mortems and cytology), clinical physiology and diagnostic radiology play a role of increasing importance in the integrated teaching, mostly of the conference or joint-round type. Clinical pharmacology is being added as an independent discipline. Social medicine, including rehabilitation, is another new subject which has a great importance in the integrated teaching. There is hardly any joint teaching of medical students and nurses or assistants, but since the students have considerable service in wards and out-patient departments during their clinical studies, they receive some "team training" with the other personnel groups.

The activities to develop the processes of teaching and learning are manifold. A programme of training in pedagogics for medical teachers has been introduced. At present, a week's course is offered once a year, including both "macropedagogics" with educational technology and "micropedagogics" with practical training within the respective department. Research and experiments in medical education are stimulated by special grants from the UKÄ (Unit for Educational Research and Development), and by the recent formation of a Nordic Federation for Medical Education and a Swedish Society for Medical Education which arrange meetings and seminars etc on educational topics. Within each of the universities, a special section for audio-visual aids is being developed, and an advisory post for a specialist in university pedagogics has been introduced.

A national organisation for the use of television and broadcasting in education (TRU, Stockholm) has been functioning for several years. Within TRU, a medical expert group produces taped television programmes for undergraduate or postgraduate medical education within the whole country. Films, audio-tapes with slides, programmed instruction material etc, are being produced locally in different medical departments.

5. EVALUATION METHODS AND EXAMINATIONS

Hitherto, all medical examinations have been undergraduate and purely a university responsibility, each subject having its own examination.

From 1969, 3 postgraduate examinations (medicine, psychiatry, surgery) have been introduced for the "general service period", organised by the NLV (Appendix 1). Examinations will also be included in the short courses during the specialist training period. The NLV examinations are arranged simultaneously for a large group of physicians, about 250 four times per year when the system is fully developed. These examinations are written, objective, with multiple-choice or short open answers. They are constructed to test clinical competence using case histories or clinical situations as the background for the questions. At least a greater part of the questions will be published, while probably a small proportion will be kept unpublished for possible repeated use.

The multiple-choice tests are scored by computer. The students mark their answers on special answer sheets that are read by an optical scanner. The optical scanning and computer processing is handled by a public service organisation, the Service Group for Optical Scanning (SOL) which specialises in educational test scoring.

6. ORGANISATION AND LOCATION OF MEDICAL FACULTIES

All the medical faculties are organised similarly, according to the regulations set by the government or the UKÄ for the universities. These regulations have recently been changed in order to introduce more student influence and to delegate the right of decision from the University Chancellor's Office more to the universities and faculties, and from the faculty in pleno more to faculty committees.

In all educational questions, the educational committee of a faculty now has the right of decision in the faculty's place. This committee usually consists of one half

teacher representatives (professors, assistant professors and instructors) and one half student representatives (including research students for MD) under the chairmanship of the Dean.

The individual departments at present are led either by a deciding head ("Prefekt") who usually is, but need not be, the professor with an advisory council including student representatives, or by a deciding board where both teachers and students are represented. In general, the contact and co-operation between teachers and students in the medical faculties have been very constructive and stimulating.

A P P E N D I X 1

OUTLINE OF MEDICAL EDUCATION PROGRAMMES IN SWEDEN

A. Undergraduate programme, compulsory courses

The 11 terms of study for the university medical degree, "Läkarexamen", comprise the courses listed in the table below. The numbers of hours etc are approximate. Since 1972, the local educational boards have the right to decide on the amount and form of teaching within the frames of each course.

Term	Subject	Hours of teaching (per student)	Period of practical or clinical service, expressed as whole-time weeks or effective hours	Type of final examination
1 - 2	Anatomy (general biology, comparative and macroscopic anatomy, clinical anatomy etc)	130	20 weeks (dissections)	graded
1	Histology (micr. anatomy, embryology etc)	110	10 weeks (microscopy)	graded
1	Medical statistics	15	-	non-graded
2	Medical genetics	10	-	non-graded
3	General chemistry	60	8 weeks (lab. procedures)	non-graded
3	Medical and physiological chemistry	60	8 weeks (lab. procedures)	graded
4	Medical physics	20	4 weeks (lab. procedures)	non-graded
4	Physiology	125	12 weeks (lab. procedures)	graded
4	Psychology	20	-	non-graded
5	Medical microbiology (bacteriology, virology, immunology etc)	58	30 hours	graded
5 - 6	Pathology (general pathology, morbid anatomy)	105	70 hours (autopsy, microscopy)	graded
5	Pharmacology	65	40 hours	graded

Term	Subject	Hours of teaching (per student)	Period of practical or clinical service, expressed as whole-time weeks or effective hours	Type of final examination
6	Clinical propedeutics (incl internal medicine, surgery, radiology, psychiatry, social medicine, nursing techniques, examination techniques and physiotherapy etc)	168	4 weeks (in wards)	non-graded
6	Clinical chemistry (incl blood-donor service)	22	30 hours	non-graded
6	Clinical physiology (incl clinical neurophysiology)	22	10 hours	non-graded
7	Internal medicine (incl internal medical specialities, and integrated teaching with surgery, diagnostic radiology, pathology, clin. microbiology, clin. chemistry, clin. physiology, clin. pharmacology, neurology and social medicine etc)	325	20 weeks (in wards, night duty, out-patient service, laboratories etc)	graded
8	Surgery (incl surgical specialities and integrated teaching with int. medicire, anaesthesiology, diagnostic and therapeutic radiology, pathology, clin. microbiology, clin. chemistry, clin. physiology and social medicine etc)	308	20 weeks (in wards, operating theatre, night duty, out-patient service, laboratories etc)	graded
9a	Psychiatry (incl social and forensic psychiatry and integrated teaching with neurology etc)	106	10 weeks (ward, out-patient service)	graded
9a - b	Defence and catastrophe medicine	45	Excursions	non-graded
9b	Dermatology (incl venereology, dermatological allergology and vocational diseases etc)	60	4 weeks (ward, out-patient service)	graded

Term	Subject	Hours of teaching (per student)	Period of practical or clinical service, expressed as whole-time weeks or effective hours	Type of final examination
9b	Infectious diseases (incl tropical medicine, infectious tbc, immunisation techniques and integrated teaching with clin. microbiology etc)	60	2 weeks (ward)	graded
10a	Opthalmology	60	4 weeks (out-patient service)	graded
10a	Otology (incl rhinology, laryngology, audiology, phoniatry, odontology, therapeutic radiology)	70	6 weeks (ward, out-patient service)	graded
10a	Forensic medicine	20	-	graded
10b	Neurology (incl neurosurgery, clin. neurophysiology etc)	60	4 weeks (neurologic and neurosurgical wards, out-patient service, laboratories etc)	graded
10b	Hygiene (incl environmental and preventive medicine)	45	Excursions	graded
10b	Social medicine (incl epidemiology, vital statistics, environmental and preventive medicine, rehabilitation, organisation of health and welfare services, medical ethics, laws and regulations etc)	60	Excursions	graded
11a	Obstetrics and gynaecology (incl preventive care and gynaecological radiotherapy, and integrated teaching with perinatal pediatrics)	120	10 weeks (ward, out-patient service, maternity ward, post-natal pediatric ward)	graded
11b	Pediatrics	110	10 weeks (ward, out-patient service, child health centre)	graded
11b	Child psychiatry (psychiatry of children and adolescents)	15	-	non-graded

B. Undergraduate programme, elective courses and integrated teaching

Terms 1 - 4 : Integrated teaching during the pre-clinical courses is to some extent given:

i. with clinical subjects;
ii. between pre-clinical subjects.

Terms 5 - 6 : Elective courses in "History of medicine" (10 hours) and "Computers and information processing in clinical medicine" (10 hours). Elective advanced study courses in individual subjects for the grade of "excellent" (grade 3).

Terms 7 - 11 : Integrated teaching during the clinical courses is generally given:

i. to some extent with pre-clinical subjects;

ii. with special clinical diagnostic and therapeutic disciplines, neuro-medicine and psychiatry, defence and catastrophe medicine, social medicine, rehabilitation medicine, environmental and vocational medicine, health care and preventive medicine.

C. Research education programme for the degree of Doctor of Medicine

After passing the university "medical degree" or acquiring similar basic education, a student may be accepted at the medical faculty for a research study course. This is directed towards one of the represented subjects within the faculty, lasts about 4 years, and includes:

1. a study course in those special areas which are judged to be of value for the student's research work; the course is individually structured, and corresponds approximately to a year's study;

2. a research project, at least partly performed independently, which is to be published and defended publicly.

D. Postgraduate medical education, general service period: The general service period (AT) comprises 1 year 9 months of training outside the university.

1. Internal medicine: 6 months of hospital service (incl up to 2 months in long-term care or in a specialised clinic or in pediatric service), plus a final examination by the NLV.

2. Surgery : 6 months of hospital service (incl anaesthesiology and intensive care; up to 2 months may be in specialised service), plus final examination by the NLV.

3. Psychiatry : 3 months of hospital service (incl child psychiatry), plus final examination by the NLV.

4. Out-patient care : 6 months of service at district medical centre (up to 3 months may be in elective clinical service).

E. Postgraduate medical education, specialist training period

Specialist training programmes usually require 3 - 3.5 years. A few examples are given below. One of these certificates will be required for any independent and qualified medical function with full responsibility, eg as a head physician or an associate head physician at a hospital department or as a specialist physician or general physician at an out-patient medical centre.

1. General practitioner certificate (3 years):

   a. internal medicine (1.5 years, 1 year may be long-term care or 6 months medical rehabilitation);

   b. psychiatry (6 months);

   c. out-patient service or social medicine (6 months);

   d. pediatrics (3 months);

   e. optional clinic (3 months);

   f. 6 week courses with examinations, arranged by the NLV.

2. Specialist certificate in internal medicine (4.5 years):

   a. internal medicine (4 years, at least 1 year at a large central hospital, 1 year may be sub-speciality within internal medicine or long-term care);

   b. psychiatry (6 months);

   c. 6 week courses with examinations, arranged by the NLV.

3. Specialist certificate in surgery (4.5 years):

   a. surgery (4 years, at least 1 year at a large central hospital, 1 year should include skeletal surgery at a surgical or orthopaedic surgical clinic);

   b. anaesthesiology (6 months);

   c. 6 week courses with examinations, arranged by the NLV.

A P P E N D I X 2

SOME NEW PARAMEDICAL PROFESSIONS AND EDUCATIONAL PROGRAMMES IN SWEDEN

A. Professions which require the "gymnasium" school followed by an academic education

1. Medical physics

Physicists with a BSc or PhD examination are engaged to supervise certain equipment and principles in therapeutic radiology, and may form an independent department under the hospital board.

2. Medical engineering

Engineers or physicists with a university degree are engaged in certain hospitals to supervise certain equipment and principles in diagnostic radiology, clinical physiology and chemistry, intensive-care units etc. At Linköping University College, a special branch of medical engineering has been established with studies in both the engineering and medical faculties, and at the 3 other existing engineering faculties (institutes of technology) a special medical programme is offered as an elective course. Recently, it was suggested by a committee that the medical engineering service at large hospitals should be developed and organised in independent units.

3. Biomedicine

A special "biomedical programme" lasting 3 terms, for students with a basic science education, mainly in chemistry, has been started at the medical faculty of Uppsala University and leads to a BSc in "biomedicine". It also gives the opportunity to acquire later a PhD in single medical subjects. Persons with this education are expected to fill posts in the pharmaceutical industry, and in different hospital or other medical laboratories.

4. Nutrition

A special "nutrition programme" lasting 2 terms, for students with a basic science education, mainly in chemistry or microbiology, has been started at the medical faculty of the Karolinska Institutet in Stockholm.

5. Logopedy

A combined programme of humanities and medicine, lasting 3 years, will be introduced in Stockholm for logopedists, who give medical speech training etc. This will include 2 terms of phonetics, 1 term of psychology and 3 terms of logopedy.

B. Professions which require a short and specialised gymnasial education of vocational type, and a period of professional service combined with parallel education

Medical assistants

As professions parallel to the nurse's profession, several lines of "medical assistants" have been introduced ("clinical" lines such as: operation, anaesthesia, diagnostic radiology, therapeutic radiology; and "laboratory" lines such as: clinical chemistry, clinical physiology, microbiology, morphology etc). The education starts after the basic school and usually lasts 5 terms. To take an example, the basic education for clinical chemistry or physiology includes one year's gymnasial school teaching, mostly in science and biology, 6 months combination of school teaching and practical training in a hospital ward, and one year's combination of practical service in a hospital laboratory for clinical chemistry (physiology) and education (mainly within the laboratory subject). At present, there is a yearly intake of

about 700 students to the "laboratory" lines, and these assistants play a role of increasing importance in the hospital laboratories.

C. Postgraduate education for nurses and medical assistants

1. Postgraduate education of 0.5 - 1 year's duration at large hospitals, starting after the basic education period (see above) as a nurse or medical assistant and after some period of professional experience.

2. Specialist education of academic type within a few medical subjects and pedagogics, of about 2 year's duration, based on the postgraduate education and leading to qualification as a teacher for nurse and assistant students etc.

D. Approximate figures for some undergraduate educational lines within the health field at the beginning of the 1970s:

Profession	Yearly admissions	Total number of students
Physicians	1,000	5,500
Dentists	500	2,000
Pharmaceutical chemists	120	600
Physiotherapists	600	1,200
Nurses	3,000	7,500
Medical assistants	1,400	3,200
Dentistry assistants	700	700

CHAPTER VII

SWITZERLAND

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1. PRESENT CONDITIONS

The Swiss medical schools are faculties of the state (cantonal) universities. Medical licensure, however, is federal and gives the right to practice in the whole country. Through federal regulation of licensure certain requirements concerning educational content, duration and modalities of examinations are defined for all schools. There are 5 full (Basle, Berne, Geneva, Lausanne, Zurich) and 2 pre-clinical (Fribourg, Neuchâtel) faculties.

1.1 Admission to medical schools. Students are admitted after completion of secondary school (total of 12 1/2 school years) at an average age of 19. Passing any of 3 types of final state college examinations or federal external examinations (Maturitätsprüfung A, B or C) gives the right to enrol in any of the Swiss faculties. In these examinations more subjects are required in the humanities than in science.

1.2 Duration and content of the present undergraduate education. The total duration of undergraduate education is 6 1/2 years.

Natural science (2 semesters)

Human biology (3 semesters)

Clinical basic sciences, "propedeutic" clinical subjects (2 semesters)

Clinical subjects including a clinical clerkship of 8 months (6 semesters)

1.3 Examinations and degrees. Each of the educational periods (mentioned under 1.2) is terminated by a federally administered examination. In passing the final examination the student obtains national licence to practice medicine. Examinations are mainly oral and practical (laboratory and bedside), although experimentation with other methods has started.

The degree of an MD is conferred by the individual university upon completion of a thesis - usually of minor scientific importance - accepted by the faculty.

1.4 Speciality board requirements including general practice are met by prescribed postgraduate stages amounting to 5-6 years, as specified by the speciality boards of the Swiss Medical Association. There are no speciality board examinations. The average postgraduate training period amounts to 10 years prior to entering into practice; this period includes an average of one year of service in the army for the majority of the male graduates.

2. OBJECTIVES OF MEDICAL EDUCATION AND OF EDUCATIONAL REFORMS

2.1 Objectives of medical education. The Swiss interfaculty committee has formed a sub-committee on educational reform. In this sub-committee ("Subkommission für Studienreform") the 5 full medical faculties, the Swiss Medical Association, the Swiss Assistant Physicians (interns and residents) Association and the Swiss

Association of Young Scientists are represented by one member respectively, the Swiss Medical Students Federation by 3 members (1). It was recognised that in this country the objectives of medical education are ill-defined. The objective to educate a "general practitioner" which still finds its expression in the law (right to practice at the end of undergraduate study) was found to be unrealistic and hardly operational, as proved by the development of educational habits: only a neglectable fraction (less than 1%) of the medical graduates go into practice after graduation while the average postgraduate training period continues to expand. In its shortest form the objective of medical education was therefore determined as providing the "educational basis for the later activity of the trainee as a practising physician in every clinical discipline or as a scientist".

2.2 Objectives of reform. In planning a reform of medical education objectives of the reform itself had to be agreed upon. These objectives were determined by educational implications of the development of the medical sciences and technology on one hand and by the evolution of student numbers and institutional structures on the other.

Educational objectives and educational content must be described in a much more concrete way than by the general statement above. In the present system educational content is defined by a list of required subjects, the limits of which are widely left to the personal judgement of the individual faculty member. Although it is recognised that even a collegial description of content is, to a certain extent a matter of judgement in view of the exponential growth of medical knowledge, such definitions were thought to be necessary. Wasteful duplication and omission of essential educational components have to be avoided. Participation of all concerned with medical education, including students in formulation of objectives and content should be sought. Objectives and content inventory of education (ie integration between the subsequent phases of education and integration among the subjects at a certain point of the curriculum). Such definitions should not be part of a law or reglementation but be subjected to periodic revision.

Educational institutions have to be adapted to the increasing number of medical students admitted. Personal contact between educator and student, lost in unidirectional teaching of large student classes, has to be re-established. Opportunities for active participation of the student in seminar, laboratory and bedside experience have to be increased.

Integration and co-ordination of medical education cannot be achieved by the mere adoption of a set of objectives and a description of content. The structural barriers between and within the educational organisations responsible for the different phases of medical education will have to be overcome.

The necessity to introduce new methods of educational evaluation is based on the following reasons:

With increasing student numbers, the involvement of the individual educator in examination procedures becomes prohibitive.

The lack of reliability and validity of the presently employed methods is a matter of increasing concern.

Feedback of evaluation on educational planning requires such change.

Comparability of competence is a prerequisite for the students right to change the faculty within the country during undergraduate study.

The lack of elective studies in the present system is thought to impede primary student motivation and precision of individual vocational career choice. Even in a reformed system the pressure of the increasing factual content of

(1) The proposals of this sub-committee were adopted by the faculties in 1970.

education will be such, as to require provision of opportunity for elective studies. A wide choice of elective programmes has to counterbalance an increasing formalisation of education.

Introduction of medical and psychosocial content early in the curriculum is considered to be necessary in the interest of:

1. conserving primary professional motivation and

2. allowing selection procedures relevant to medical practice at this point.

The present duration of medical undergraduate and graduate education is a matter of concern in view of the increasing educational costs and the social structure of the medical profession. Measures to shorten formal education have to be studied.

3. REFORM OF ADMISSION PROCEDURES TO MEDICAL SCHOOLS

Admission requirements were loosened nationally in 1968 by recognising the third type (C) of final college degree (with no classical language subjects required) for admission to medical schools. This has added to the rising number of medical school applications which results from an increasing proportion of students seeking higher education and a shift towards medicine in their academic career selection: the number of students passing the final licensure examination in 1966 was 292, 396 in 1969 and 541 in 1971. This trend will continue on the basis of the number of already admitted students. Although this increase is by far not met by an adequate increase in the number of teachers and in facilities, discussions concerning measures to limit admissions are still on a political and ideological level. Legality of such measures by the individual universities with regard to Swiss students is being questioned.

At the universities of Geneva and Lausanne, however, admission to the medical faculty has been limited since 1970 and 1969, respectively, using priority criteria consisting of state (cantonal) and national citizenship and location of residence of the applicants, while unofficially measures of similar nature are operative at other schools. Admission of foreign students, is limited at all schools, with a variety of selection criteria.

All kinds of selection procedures are being discussed, including the use of final college grades (a low but significant predictive value of these grades for performance in medical school has been demonstrated), introduction of an admission test (either national or cantonal) or an introductory course followed by a screening test.

In the meantime the examination at the end of the first year (natural sciences) remains the most important device of selection in medical education. The average primary drop out rate in this examination is about 25%. The final drop out rate cannot be calculated with the data available since all examinations might be repeated twice. The predictive relevance, however, of such a procedure is a matter of growing concern.

4. REFORMS OF CURRICULA AND TEACHING METHODS

4.1 Organisation. In the above-mentioned proposal accepted by the faculties (1) responsibility for reforms in medical education is both national and regional (ie the individual medical faculty). The timetable of the curriculum and examination methods and content are to be co-ordinated nationally while the faculties are to decide on educational methods and structures. The national plan entails

(1) Although each of the 5 full medical faculties supported this proposal, the legal significance of their approval amounts hardly to an agreement in view of the autonomy of the cantonal school authority.

an experimental period of at least 6 years, during which it should be possible to deviate from current federal regulations if necessary and culminating in proposals for a revised set of regulations. A long-term working party of experts ("Arbeitsgruppe für Langzeitplanung und Examensfragen") has been appointed to evaluate experiences during this period.

4.2 Curriculum. The national framework consists of a 6 year programme divided in 5 blocs by national examinations (Fig 1). In comparison to the present system it contains the following innovations:

The pre-clinical period will be shortened from 2 1/2 to 2 years. This does not imply relative diminution of pre-clinical subjects but rather an interchange of content between the 2 phases of education still termed as "pre-clinical" and "clinical". A reform model according to these specifications has been constructed by a group of faculty members at Berne. Realisation of this model began in 1971 in Berne with federal financial aid.

The proposal by the national sub-committee includes a final year when the student will be able to choose his courses. This proposal is not meant to prevent such a choice earlier on in the curriculum, but the latter would be left to the responsibility of the individual faculty. During this final year a wide choice of educational programmes elaborated by clinical and theoretical departments, peripheral hospitals and practising physicians (stages up to 2 months) will have to be offered. Except for the general approval of such programmes by a supervising committee, there will be no limitations on the choice made by the individual student. A co-ordinating organisation should provide the opportunity for this choice to be made at the end of the final year of formal education. By this time the student has had an insight into all the scientific and medical subjects and should have an optimal awareness of his personal predilections and capabilities. Some of these programmes could later be approved as part of speciality board requirements. By this procedure a more precise selection of the postgraduate training career and a shortening of the total length of education is expected to take place.

The proposal for a final year when the student would be able to choose his courses, met, however, with opposition from some faculty and student representatives, who argued that the favourable experiences of the present clinical clerkship would be lost if the student did not have the opportunity to return to formal learning after taking the programmes of his choice and that contact with practical hospital learning would be delayed in the curriculum. Although clinical clerkship experience is meant to be included in the 4th and 5th year, the medical interfaculty committee decided to approve elective choice of studies in the 5th or the 6th year of the curriculum provided that each faculty adopted one or the other programme uniformly. In the meantime the full medical faculties, with the exception of Zurich, have adopted the plan originally proposed (as shown in Fig 1).

4.3 Regional reforms. Co-ordinated and integrated subject teaching (teaching by content item, organ systems for instance, rather than academic subjects) is beginning to be introduced in most of the full medical faculties. It concerns mainly lectures given within one particular period of the curriculum (horizontal integration) rather than subjects taught in subsequent periods (vertical integration). Contacts between representatives of clinical and pre-clinical faculty members concerning educational planning and integration are rather sparse or have only begun in many faculties.

Innovations in teaching methods are also predominantly initiated by individual educators. Installations for production and display of audio-visual teaching programmes are at the disposition of some departments, but there are no audio-visual centres operating as service organisations for the faculties. Planning of such services, however, is under discussion in several faculties. Although standard text-books are in general available to students in departmental

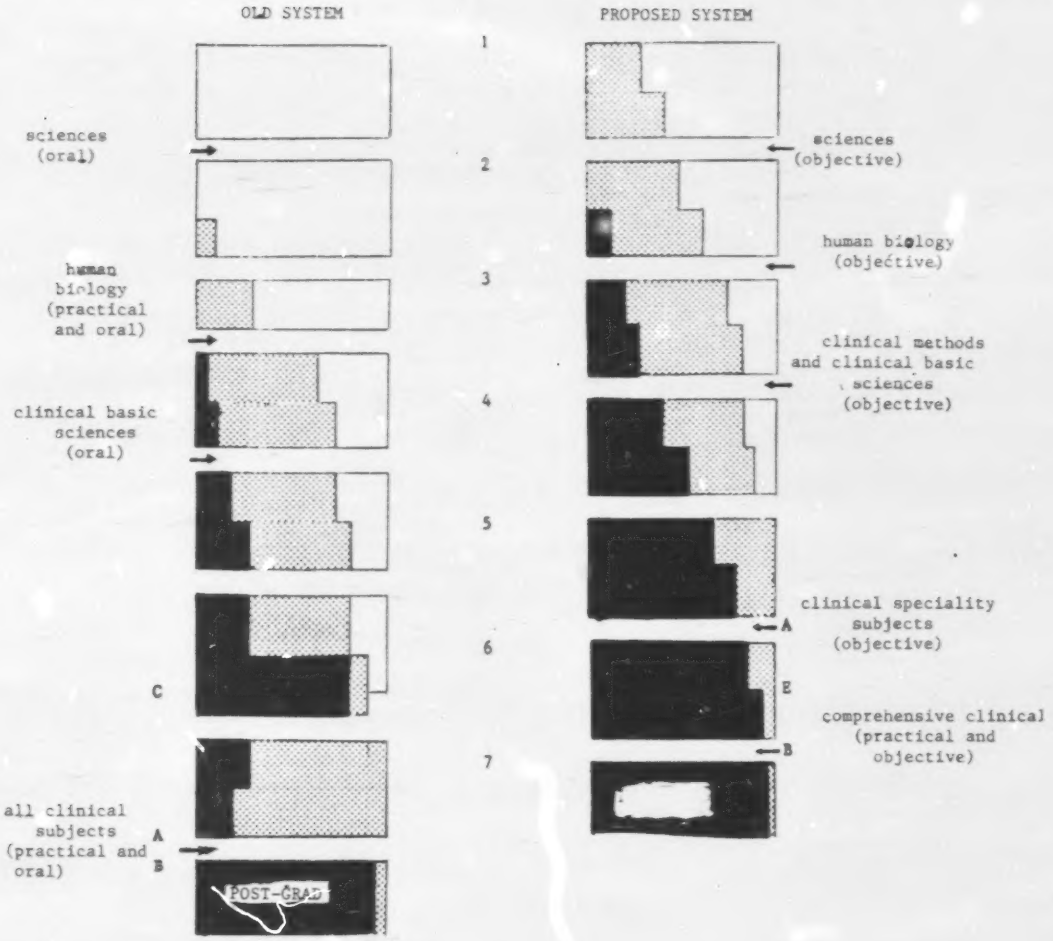

Figure 1 - Proposed national framework of medical education

non-medical contents

theoretical medical content

practical medical contents

examinations

A B parts of final, licensure examination

C clinical clerkship

E elective studies

and some central libraries, the latter are in general not sufficiently equipped to be intensively integrated into the educational system.

At present the required clinical clerkship may be spent in any of the hospital departments approved by the Swiss Medical Association. Inclusion of formal teaching units outside the departments of the medical school exclusively concerns peripheral hospitals. This development was initiated by the lack of patients and teachers in the university departments to provide sufficient bedside learning opportunities for the growing number of students; concern about unrepresentative patient selection in university medical centres might have been a secondary motivation. While formerly non-affiliated municipal hospitals were being included in undergraduate teaching in most faculties, the medical schools in Basle and Zurich have realised such contracts with hospitals outside the city area. In these peripheral hospitals students spend up to one day and a night per week in a bedside teaching course. A more extensive incorporation of peripheral units (3 days per week) at the expense of formal teaching time is being introduced in Berne since 1972.

5. EXAMINATIONS AND LICENSURE

5.1 Science degree in medicine. A science degree in medicine, not giving the right to practice, is introduced by the faculty of Basle only. There are no plans to institute such a degree on a federal level, although this topic is being discussed by several planning groups.

5.2 Introduction of objective examinations. Although it is recognised that optimal selection and educational system analysis should be based on a variety of evaluation techniques, the introduction of multiple choice type examinations seems to be the most promising implementation in the present situation. With the aid of the federal committee supervising national examinations and licensure in medicine ("Leitender Ausschuss für die eidgenössischen Medizinalprüfungen") the legal basis for the realisation of such examinations has been issued by the Federal Ministry of Internal Affairs.

New examination procedures have already been realised. Several individual departments have introduced multiple choice tests in official examinations, using a variety of item constructions, scoring and statistical evaluation techniques. Interfaculty tests are arranged among the 5 medical faculties by teachers in certain basic and clinical subjects (pharmacology, biochemistry, physiology, pathophysiology, microbiology, pathology, surgery, internal medicine). These tests are given simultaneously, using optical scanning and computer-aided scoring techniques. Statistical data including discrimination indexes of the total test and item analysis are calculated at the Institute for Medical Education and Assessment Research of the Berne faculty.

Further planning in examination techniques is done by a sub-committee of 6 members (one expert in methodology, 3 faculty members and a representative of the Federal Supervising Committee and of the residents' and students' associations) assisted by a working party of experts responsible for assessing current experimental methods.

The final structure of federal medical examinations as proposed by the above sub-committee is now (July 1972) being discussed by the Swiss interfaculty committee. So far, the following suggestions to the federal agencies have been agreed upon, subject to the approval of the majority of the faculties.

1. Written (multiple choice) examinations are to be introduced in all subjects.

2. Examinations in specialised subjects studied during the clinical training period (3rd to 6th year) will be held at the end of the year during which subjects are taught, varying according to the faculties concerned.

3. After completing the curriculum, each candidate will be required to take 2 "comprehensive" examinations conducted in hospital, not specifically geared to a clinical subject. The examiners will be selected according to the type of case, which is chosen at random. The candidate will be observed while dealing with the patient and should be graded according to his clinical skills and behaviour.

6. FACULTY AND DEPARTMENT STRUCTURE

The sparsity of administrative manpower is one of the most prominent shortcomings in undergraduate educational structure. In only one (Geneva) of the 5 full medical schools the Dean is holding a full-time position, while in the others this position is linked with the chairmanship of one of the departments. The same holds true for the position of a Dean of education which has been established in Berne. The faculty in Basle has decided to create a full-time academic position in education, full-time administrators to the faculty are appointed in Geneva and Berne. In some of the schools younger faculty or staff members or even students are charged with some of the administrative tasks like time co-ordination of lectures and courses and student counselling. For example, in Berne a student is at the present time employed full-time by the faculty in educational planning.

While inclusion of formerly non-affiliated hospital units in teaching activity of existing schools continues, establishment of new schools is being considered in several larger state (cantonal) hospitals. On the basis of a prediction of future health care need, only one of these projects is presently being supported by the federal authorities; in St. Gallen a state medical school (with the exclusion of pre-clinical departments) is being planned to open in 1973 or 1974.

With the exception of a project concerning a state university in educational sciences (Aarau), which may or may not include a medical faculty, there are no plans for educational systems integrating medicine into domains exceeding its classical academic scope.

CHAPTER VIII

TURKEY

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1. INTRODUCTION

1.1 Medical faculties. There are 11 medical faculties in 5 universities in Turkey (Table 1). 3 technical universities, namely Istanbul Technical University, Middle East Technical University (Ankara) and the Black Sea Technical University (Trabzon) do not include faculties of medicine.

Table 1 - Medical faculties in Turkey

University	Faculties
Istanbul University:	Istanbul Faculty of Medicine Cerrahpasa Faculty of Medicine (Istanbul) Bursa Faculty of Medicine (Bursa)
Ankara University:	Ankara Faculty of Medicine Diyarbakir Faculty of Medicine (Diyarbakir)
Hacettepe University:	Hacettepe Faculty of Medicine (Ankara) Gevher Nesibe Faculty of Medicine (Kayseri) Eskişehir Faculty of Medicine (Eskişehir)
Ege University:	Ege Faculty of Medicine (Izmir)
Atatürk University:	Atatürk Faculty of Medicine (Erzurum) Çukurova Faculty of Medicine (Adana)

1.2 History. The Gevher Nesibe Faculty of Medicine in Kayseri was established in 1206 by the Seljuk King Giyaseddin, executing the will of his sister, Princess Gevher Nesibe. In addition to the school of medicine, a teaching hospital was built in the same style as the school. The personal properties of King Giyaseddin and Princess Gevher Nesibe formed a foundation to support the hospital and school. In these 2 connected buildings medicine was taught until the beginning of the 20th century.

The same buildings were restored during the first decades of the 20th century and now the teaching of medicine continues. New buildings for research in basic sciences are being added.

Medical teaching started in Suleymaniye, Istanbul in 1399. The modern medical instruction was however instituted in 1827 when a new military medical academy was started; this was the beginning of Istanbul University Faculty of Medicine.

In 1946 Ankara Faculty of Medicine was established followed in 1956 by Ege Faculty of Medicine, 1963 Hacettepe Faculty of Medicine, 1966 Atatürk Faculty of Medicine, 1967 Cerrahpasa Faculty of Medicine and 1968 Diyarbakir Faculty of Medicine.

2. PRESENT SYSTEM

2.1 General pattern of teaching. In Turkey the medical faculties are attached to the universities which enjoy freedom in administrative and academic affairs. This makes it possible for medical faculties to have different systems of education and training. Yet the teaching of medicine can be divided into 2 categories:

1. Those following the traditional system of teaching. These are the faculties of medicine of Istanbul, Ankara and Ege universities. Teaching in these faculties is patterned on the continental European systems. The main characteristics of education in these faculties will be described below under the heading "Faculties using the traditional system".

2. Those using an integrated system with the accent on community health. Medical faculties attached to Hacettepe University and Atatürk University fall into this category. A detailed description of this system will follow under the heading "Faculties using the integrated system".

2.2 Admission to medical faculties. Most of the Turkish universities have agreed to conduct a common aptitude examination which is given to graduates of Turkish secondary schools. This examination is of the multiple choice objective type and is held simultaneously in the major cities in Turkey and in several Turkish consulates abroad. Lists are made from the highest to the lowest scores. Every university has authority to decide how many students should be taken to their medical faculties and since the number of applicants is far in excess of the places available in each faculty, those with higher scores are given preference. Presently all medical schools use these criteria for admission but any university has the power to change its rules of admission. The average age of students entering the medical faculties is 18 to 19.

2.3 Diplomas awarded. All medical faculties in Turkey award the diploma of Doctor of Medicine. This licenses the graduate to practice medicine. In faculties using the integrated system a pre-diploma internship period is included in the curriculum, which means that the term of study in these schools is 7 years rather than 6 years in schools using the traditional system.

2.4 Specialisation. As described above, graduates of Turkish universities are allowed to practice medicine without any further licensing formalities. On the other hand, specialisation in medicine is governed by regulations of the Ministry of Public Health. In most areas of medicine or surgery, 4 years' residency training in approved hospitals is required before speciality examinations can be taken. This period may be extended to 6 years, for example for neurosurgery, or thoracic surgery. These examinations are conducted by a board of examiners approved by the Ministry of Public Health but faculties of medicine are also authorised to organise specialisation examinations along the same lines.

3. INNOVATIONS

Until 1957 all faculties of medicine in Turkey followed the same system of teaching patterned after that of Istanbul University. Since then efforts have continued in each medical faculty to introduce changes in the teaching system which has led to slightly different programmes of instruction.

In 1962 it was decided to establish Hacettepe Faculty of Medicine with an entirely new approach. This school was opened in 1963 and an integrated teaching system was adopted. Presently 3 faculties of medicine in Turkey with similar teaching philosophy and methods are in operation. These are Hacettepe Gevher Nesibe faculties of medicine, both attached to Hacettepe University, and Atatürk Faculty of Medicine in Erzurum.

The remaining 5 faculties - the 2 faculties of Istanbul, the 2 faculties of Ankara and Ege Faculty of Medicine continue more along the traditional lines.

While describing the features of medical faculties of Turkish universities it will be convenient to group them under 2 separate headings.

3.1 Faculties using the traditional system. The course of study is 6 academic years, each year being divided into 2 semesters. The first year is mainly devoted to premedical studies including physics, chemistry, biology (zoology and botany). In some faculties mathematics and statistics and an introduction to anatomy are also included in the programme.

Instruction in a foreign language is started during the first year and continued in the later years unless the student proves his proficiency in the language, in which case he is excused.

The second, third and fourth years are mainly devoted to basic medical sciences -- biochemistry, anatomy, physiology, microbiology, parasitology, pathological anatomy, physiopathology, pharmacology, forensic medicine, hygiene and preventive medicine.

Introduction to clinical sciences is started during the third year and increased in the fourth year. The fifth year is exclusively devoted to teaching of clinical sybjects and the final (sixth) year to clerkships in clinical departments. Some of the faculties devote the fifth and the sixth years to clerkship and during these years theoretical teaching in clinical subjects also continues. Attendance to courses is obligatory.

Examinations are given at the end of each course. In many instances there are also intermediary examinations before the final examinations.

3.2 Faculties using the integrated system. The total course of study is 7 academic years. The student first completes a 2 year premedical phase at the school of basic sciences of the university. In order to be admitted to the medical faculty, the student must have satisfactorily completed the prescribed courses in physics, chemistry, molecular biology, mathematics, applied basic statistics, general psychology, social anthropology and a foreign language. Approximately 47.5% of the 2 years are devoted to the study of sciences, and 52.5% to the study of humanities and social and behavioural sciences. In this premedical training, students are given statistical information on demographic problems, and social problems related to population growth as well as cultural aspects of family planning are taught. Following the premedical phase, students are admitted to the faculty of medicine for a 5 year course.

An integrated teaching approach to medical education is the main characteristic of the Hacettepe system. The subject matter is arranged not merely according to the various departmental topics, but in such a manner that a particular subject, such as the cardiovascular system, is taught with its anatomy, physiology, biochemistry, pathology and clinical aspects in an integrated and co-ordinated programme in a given study term. In cell biology, for example, the morphology and function of the mammalian and bacterial cells are taught together with their biochemical characteristics. Isolated departmental laboratories would not facilitate such a multidisciplinary study, and, therefore, the student laboratories in the schools run according to this system are designed in a fashion which enables the student to have a unit of his own in this laboratory which he retains throughout his training period. All his laboratory studies take place in this multidisciplinary laboratory unit. The only exception is anatomical

dissection and autopsies which are performed in a separate area. Dissections are carried out on newborn cadavers during the second year. 100% full-time teaching staff (none being engaged in private practice) has facilitated the implementation of the integrated teaching system in these medical schools.

Table 2 shows the teaching programme during the first 4 years of medicine. It may be seen that the first year is divided into 6 blocks of study terms. Each study term is administered by a committee composed of representatives from the different disciplines which are involved in that particular study term. As it will also be seen from the figure, maternal and child health and community medicine are integrated parts of the curriculum from the very beginning. During the first year, 4 hours of theoretical teaching a week is devoted to community medicine, of these 2 are lectures and the remaining 2 discussions in small groups.

Each first year medical student is assigned to a family in which there is either a pregnant woman or a baby of less than one year of age. The student is introduced to the family as their "student doctor", and he takes part in the periodical medical checks. Gradually, the student takes increasing responsibility, but, of course he is under the supervision of the doctor assigned to the family through the maternal and child health unit of the medical faculty. In this way, from the inception of his medical education, the student is exposed to the fundamental principles of observing and recording all pertinent information about the patient.

During the first year of the medical course, approximately 20% of the curriculum time is set aside for clinical sciences and community medicine. The remaining 80% of the curriculum time is devoted to basic medical sciences. The regulation of body fluids and the principles of fluid and electrolyte therapy are among topics taught during this period.

The second year is also divided into a number of study terms as Table 2 shows. During this year, basic medical sciences, such as microbiology, pharmacology and pathology are taught, again in an integrated fashion. Here too, the student is first exposed to morphological and physiological changes observed in mammalian cells and tissues under infective, radiological or metabolic pathological conditions. The principles of re-establishing normal physiological conditions and the basis of drug action are presented. The effect of bacteria on human cells is discussed, and the clinical picture and tissue manifestations of infections are introduced. Various immunological disorders are also discussed. Next the basic pathological changes of the various organ systems are introduced and discussed by instructors from the departments of microbiology, pathology, pharmacology, biochemistry, physiology and anatomy, and the clinical departments. Thus, the student is given an overall view of the clinical conditions related to the system under study. It is estimated that some 65% of the curriculum time is spent on basic medical sciences and 35% on the clinical sciences and community medicine during the second year. Psychiatry is the main clinical area which is stressed during this year. Some 338 hours of the curriculum time in the second year are unscheduled in order to give the student an opportunity to complete unfinished work or to enjoy recreation if he so wishes.

Beginning in the third year and continuing through the fourth year, students rotate as clerks through various clinical departments. During this period, instruction continues in seminars, clinico-pathological conferences, group discussions, case presentations and symposia. The students are also expected to take some responsibility for night duties. During the third year, each student spends 2 1/2 months in medicine, surgery, obstetrics and gynaecology and pediatrics respectively. The weekly programme in these clinical areas includes 20 hours of ward work, 16 hours of lectures and case seminars, 1-2 hours of clinico-pathological conference, 4 hours of pathology and radiology seminars and approximately 4 hours of interviewing patients or their parents.

During the fourth year each student rotates as a rural health intern and lives in a village. Home calls are part of his responsibility. For rural internship purposes, in Ankara, 7 health centres, located in 7 villages, with a total

Table 2 - integrated system, first four years

YEAR	STUDY PROGRAMME								
1	Cell Biology Study Term 7 weeks	Tissue Biology 9 weeks	Cardio-vascular Respira-tion 4 weeks	Metabolism 7 weeks	Central Nervous and Endocrine Systems and Reproduction 8 weeks		Mechanisms of Cellular and Tissue injury 4 weeks		
	Maternal and Child Health - Community Medicine - Family Clinics								
2	Mechanisms of Infec-tion and Infectious Diseases 8 weeks	Cardio-vascular System 4 weeks	Respir-atory System 2 weeks	Urinary System 3 weeks	Gastro intestinal System 3 weeks	Haemato-poietic System 4 weeks	Musculo-skeletal System 3 weeks	Reproduc-tive System 6 weeks	Nervous System 5 weeks
	Chemical Agents 15 weeks		Clinical Psychiatry 12 weeks					Endocrine Sys 4 1/2 weeks	
	Community Medicine - Family Clinics								
3	Clerkship: Daily 8.00 am to 5.00 pm and night calls								
	Medicine 2 1/2 months	Paediatrics 2 1/2 months	Surgery 2 1/2 months	Obstetrics and Gynaecology 2 1/2 months					
	Clinico-pathological and Radiological Conferences and Social Medicine Seminars								
4	Community Medicine and Maternal & Child Health (Rural internship) 2 months	Psychiatry 1 month	Neurology 1 month	Electives 2 months	Rotation in Dermatology, Urology, Ophthalmology, Orthopaedics, Otolaryngology and Physical Medicine 4 months				
	Clinico-pathological and Radiological Conferences and Social Medicine Seminars								

population of 50,000 are used. These centres are attached to a 50 bed rural hospital and the entire complex is staffed by members of the medical faculty. In Erzurum, where Atatürk University is located, students use 12 rural health centres. The instructors live in the villages and serve as rural health officers in all cases. This arrangement has been made with the co-operation of the Ministry of Public Health and the respective local authorities.

The student has a 2 month elective period during the fourth year and he can choose what he does. Some students work in other hospitals during their elective periods.

The fifth year is the pre-diploma internship period. The student can select one of the 4 alternatives, according to Table 3.

Table 3 - Integrated system, 5th year

Alternative	Study programme	
1	Internal medicine	6 months
	Paediatrics	4 months
	Emergency service	2 months
2	Paediatrics	6 months
	Internal medicine	4 months
	Emergency service	2 months
3	Internal medicine	4 months
	Paediatrics	4 months
	Surgery	2 months
	Emergency service	2 months
4	Internal medicine	4 months
	Paediatrics	4 months
	Obstetrics & Gynaecology	2 months
	Emergency service	2 months

During this year the student lives at the hospital and is on duty every other night. He carries the usual responsibilities of a junior resident or a house physician, under the supervision of the senior house staff and the teaching staff.

The examination procedures also have certain characteristic features. The evaluation system has 2 major components. The student is appraised by his instructors not only on his performance on formal examinations but also on his performance in group meetings and journal studies, his ability to think scientifically, and his ability to deal with patients and their families in the family clinic setting. This appraisal is made on a continuous basis. Frequent intermediary examinations are regular features of the evaluation system. Results of continued evaluation make up about 65% of the student's total grade.

The remaining 35% of the grade is determined by the student's performance on a formal written examination given at the end of each phase of his training. These examinations are not set by individual departments but by sub-committees representing all the departments involved in that phase. It is hoped that the examination system not only provides a means for assessing the student's ability to co-ordinate the knowledge he has acquired but also serves as yet another instrument for learning.

3.3 Comparison of the 2 systems of medical education. From the above descriptions it is seen that the medical faculties in Turkey are using 2 distinctly different systems of education. This provides a valuable opportunity to compare the results of 2 systems in one country.

Although it is premature to draw any definite conclusions as to the superiority of one over the other at this stage, the results so far seem to be in favour of the integrated system.

CHAPTER IX

UNITED KINGDOM

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1. INTRODUCTION

In order to understand the scene in the United Kingdom it is necessary to bear in mind certain important administrative features.

Medical schools and universities

Every medical school is part of a university, although historically many medical schools were first formed in association with a hospital and only subsequently became part of a university.

Autonomy of universities

Universities are autonomous bodies. They receive most of their money from the state. Naturally state financing is used to ensure broad conformity to national policy, but universities need not accept money for special purposes if these are contrary to their own policy and they are totally independent in matters of detail. Academic freedom from political interference is considered to be essential.

General Medical Council

Educational and professional standards for medicine are supervised by the General Medical Council for Education and Registration. This body, which is established by Act of Parliament but which is independent of government, is responsible for keeping a register of properly trained and qualified medical practitioners.

Only those who are registered can prescribe dangerous drugs, sign death certificates, be employed in a clinical capacity in the National Health Service and perform certain other medical functions - such as giving an anaesthetic.

The GMC recognises the training in approved medical schools as being of a proper standard and it also recognises certain examinations as being of a requisite standard to allow those who pass to be placed on the register. When a student has passed his final university medical examination, he is placed on a "provisional register" and he then has to satisfactorily complete the 2 6 month approved hospital appointments, one in medicine and one in surgery, before his name is placed on the full register.

Every 10 years the GMC issues "recommendations" concerning the undergraduate medical curriculum and every medical school must conform to these if it is not to run the risk of having approval withdrawn, and that its graduates would be unable to register. Up to 1957 these "recommendations" dealt in some considerable detail with the medical curriculum so that the undergraduate courses in most British medical schools were very similar. The recommendations which were issued in 1957, however, were much more general and allowed considerable scope for change and experimentation. The most recent recommendations are still broader and they encourage variety and change in the medical curriculum.

The Royal Commission on Medical Education

The need for change and for variety was given authoritative blessing by the Royal Commission on Medical Education which was set up by the government in 1956 under the chairmanship of Lord Todd. Various suggestions were made about the undergraduate curriculum, but it was emphasised that they were only suggestions and that each medical school should experiment in its own way.

It was strongly recommended, however, that all medical practitioners would require a period of vocational and specialist training after registration and it will be seen that if this were a universal requirement much more freedom would be conferred on the undergraduate portion of the training. The Todd Commission is having a considerable influence on the development of medical education in Britain and frequent reference will be made to it.

The control of recruitment and medicine

In Britain there is no obligation for a medical school to take more students than its facilities would warrant, nor for it to lower its standards in order to fill vacant places. The Todd Commission in forecasting the future number of doctors required in the country concluded that the number of places in medical schools should be increased so that the annual intake would rise from the 2,000 of 1960-64 to 5,000 between 1985 and 1989. The government has not yet made plans for so far into the future but the annual intake of medical schools has already been increased to 2,870 in 1970 and the target number of places has been fixed at 4,100 for the later 1970s. This will be provided by expanding existing schools including the newly established school at Nottingham and Southampton and a further school is to be established at Leicester. As a result of these development most schools will have an intake in the region of 200 students per annum.

The position of the National Health Service in medical education

The National Health Service is entirely government financed so far as the hospital and family doctor services are concerned. For matters like public health, welfare clinics and school medical services the organisation comes under the local government. The hospital services are organised on a regional basis, there being 5 regions in Scotland and 15 in England and Wales. Outside of London all but one of these regions have a medical school at their medical capital. Certain obligations are placed upon the teaching hospitals to provide proper teaching facilities, but it can be seen that a considerable liaison must exist between the medical schools and universities on the one hand, and the hospital authorities on the other. Similarly, the medical schools have also established close working arrangements with the local preventive health and welfare services. Many medical schools have a number of general practitioner-family doctors working part-time on their teaching staff, and some have university general practices which are used for teaching students.

In teaching hospitals the major disciplines usually have teams composed of full-time university employed clinicians. They are accorded honorary contracts by the hospital, but they are only a small part of the hospital team and the medical schools rely heavily on the hospital staff to participate in teaching.

Postgraduate medical education is expanding rapidly in Britian, vide infra. It is accepted that funds for the major part of the vocational aspects of this should come from the National Health Service. The academic aspects are funded by the universities - and to some extent by bodies such as the Medical Research Council. The universities with medical schools, however, play a key role in the organisation of postgraduate medical education in their regions and, because of their great prestige and the fact that they grant most of the postgraduate diplomas and qualifications, the various royal colleges have a considerable influence throughout the country.

2. POSTGRADUATE EDUCATION

It may seem curious to start at the end rather than at the beginning of medical education, but education is goal-oriented and it seems reasonable to work backwards from that goal, the practising physician.

Two things are at once evident. The first is the very great and increasing rate of medical knowledge and of practical advances, and this is of crucial importance throughout the whole medical education. The second is the very great diversity of activities in which doctors play a role. These inevitably call for an increasing degree of specialisation and for a process of continuing postgraduate education for all. There are thus 2 aspects of postgraduate education which need to be considered - vocational or specialist education and continuing education.

Vocational or specialist education

It was advocated by the Todd Commission that postgraduate systematic training should be available for all, including general practitioners, and that it should be much more carefully arranged than the present haphazard system of moving from one post to another. It was recommended that doctors, after completing the initial compulsory intern year, should be able to enter rotational training which would vary according to the branch of medicine in which they wished to specialise. The first 2 or 3 years of this specialist training should be fairly general and this should be followed by some years of more specialised training. For example, the intending specialist in cardiology might spend the first 3 years rotating in posts in internal medicine and its specialities; he might obtain some further experience of psychiatry and perhaps spend some time assisting in a family medicine practice and if he were able, he might carry out some research. After satisfactorily completing this period he would then move on to specialise more or less exclusively as a cardiologist - a process which might take an additional 3 or 4 years.

Postgraduate training throughout the country has now moved very rapidly in the direction advocated by the Todd Commission. Various types of rotating schemes for those entering hospital specialities have been started in many centres and, as they are proving very popular, men of high calibre are being appointed as trainees. Many centres have also initiated training schemes for general family practitioners. However, intending general practitioners can earn much more by taking junior posts in general practice than by entering these programmes. Nevertheless, although the earlier attempts sometimes foundered because of lack of applicants, the situation has improved recently. It would be unrealistic to think, however, that these training schemes are likely to extend to encompass more than a small proportion of those going into general practice unless they are made compulsory - an event which is highly unlikely - or unless they are made more worthwhile financially for the trainee. It seems probable that by 1977 all who wish to have independent personal clinical responsibilities in general practice will be required to have successfully completed a 3 year period of approved training.

Continuing postgraduate education

Within the specialities there are many devices for keeping up to date, such as professional journals and medical societies. It has been felt for some time, however, that something more should be done, not only to bring recent advances to the notice of general practitioners, but to cross fertilise between specialities.

A number of means are being developed for these purposes. For example, Scottish Television and Tyne Tees Television, both commercial companies, have been broadcasting postgraduate medical programmes for 7 years. Since 1966 the BBC has similarly been broadcasting such programmes on their television network. The programmes are made by various specialists and teachers, usually from medical schools. The broadcasts are not scrambled - this is illegal in Britian - so that they cannot be seen by the general public, but they are broadcast at times other than the normal programmes. The fact that they can be seen by any member of the public who cares to turn on his set

obviously puts a limit on the possible content of the programmes. However, the ordinary "entertainment" broadcasts are not so very inhibited and in practice the limitations are not severe.

A most important development has been the construction of postgraduate medical centres at a very large number of hospitals throughout the country. Some of these have been sponsored by private funds - by local medicals themselves and by local industry - and others, to an increasing extent, are being provided by the hospital authorities. In these centres there is usually a clinical lecture theatre, a library, perhaps some study rooms, maybe an exhibition room, and a common room with catering facilities. There are also offices for the local "clinical tutor", vide infra, and his secretary. These centres are becoming the focal point for medical education in their district and are hives of activity. Not only do they serve as teaching centres for the hospital group in which they are situated, but they form a meeting point for all doctors of all disciplines in the area. For example in many of these centres a luncheon may be held once a week followed by a lecture, clinical demonstration or debate.

In addition to this, every medical school centre organises a series of post-graduate courses. These may be at all levels from refresher courses to highly specialised instruction. Many of these are open to people from all over the country. Usually, in these medical school centres there are courses designed for the various postgraduate specialist trainees in the surrounding hospitals. They are often of an "extended" type, taking place perhaps one afternoon, or one evening, each week for many weeks. Arrangements are being made for general practitioners to be attached to hospital departments for periods of one or 2 weeks.

This type of continuing education, particularly for general practitioners, is encouraged by the Department of Health. A system has been developed whereby fees for attending approved courses and various expense allowances are paid by the department. A general practitioner must also attend, for some time, a certain number of recognised postgraduate activities in order to retain a certain element in the payment he receives from the state. Fees for specialist trainees, who attend local courses, are usually paid by the hospital authority employing them. Recently courses at an advanced level suitable for specialists and supported by the Department of Health and Social Security have been arranged.

Administration of postgraduate education

The postgraduate education, which has so far been described, has grown up, and is organised, at a local and regional level. The University and Regional Hospital Board (the authority responsible for all the hospitals in the region; in England and Wales, however, there are in each region one or more teaching hospitals, associated with a university medical school, which are administered separately by a board of governors) have an important part to play in the administration of this. There is usually a postgraduate Dean who may also be, or who may work closely with, a regional director of postgraduate education. In hospital groups throughout the region a clinical tutor is appointed by the university after consultation with the Regional Hospital Board. This man gets a small honorarium, for which he is responsible for encouraging, facilitating and organising postgraduate activities within his group. He is usually one of the senior hospital staff who is interested in this activity, but, of course, he is otherwise mainly occupied with his ordinary clinical duties.

At a national level there are 3 separate councils for postgraduate medical education and training, one for England and Wales, a second for Scotland, and the third for Northern Ireland. All 3 bodies are concerned with the organisation of training in their respective regions and with the co-ordination of activities on a national scale. They are also charged with advising the relevant ministries about the finance and facilities necessary for an efficient and effective system of postgraduate education.

At the moment there is no system of specialist registration. In effect, a man in the hospital service becomes a specialist when he is appointed to a consultant post by a hospital authority. In order to obtain such a post, which is always openly advertised,

he must have acquired the appropriate postgraduate qualifications (eg fellowship of a Royal College of Surgeons or membership of a Royal College of Physicians) and to have held a series of junior hospital posts which are considered suitable by the appointing committee. Guidelines for training in the different specialities have been drawn up by the various appropriate royal colleges, and an appointments committee contains one representative from a royal college as well as a university representative.

At present, there is no such carefully controlled system in general practice. A man can practise with full responsibility as soon as he has been registered. He must be appointed by a local executive committee, however, if he wishes to practise within the National Health Service and, generally, he must have had a certain amount of experience as an assistant or trainee before he becomes a principal in general practice.

The possibility of starting a specialist register is now under discussion. This would also include general practitioners who have special skills of their own. It would seem possible that this development will take place in the near future, but the whole problem is at present being debated.

3. UNDERGRADUATE EDUCATION

Objectives

It can be seen from the outline of what is happening in postgraduate education that medical schools need no longer aim - and indeed are no longer able - to produce at graduation a man possessing "the knowledge and skill requisite for the efficient practice of medicine, surgery and midwifery". They do in fact prepare their students for a wide range of professional careers in which they have full personal responsibility only after a further period of postgraduate training. The student should therefore be educated in medicine as much as trained. He will need to possess enough knowledge of the basic skills and the right attitudes, and to have experienced a sufficiently wide scope of medical practice to be able to choose that branch of medicine which interests and suits him best. His education and the attitudes he has acquired should carry him through the whole of his professional career. He will have to be capable of adapting to new circumstances and using new methods, for one of the salient features of modern medicine is its rate of advance. In general he should be particularly skilled in problem solving within the framework of medicine.

These aims have been stated, for they are probably those which are accepted by most of those in Britain who are interested in medical education. They therefore point the way to current and future reforms in medical undergraduate education in this country.

Curriculum

Traditionally, the medical curriculum lasts for 6 years and is divided into 3 phases. The first phase lasts for one year and consists of premedical studies in chemistry, physics and biology. The second phase lasts for 5 university terms (almost 2 years) and mainly consists of the study of the pre-clinical subjects of anatomy and physiology. The third and final phase, the clinical phase, consists of the theoretical study and practical experience of all the major clinical subjects including pathology, microbiology, clinical biochemistry, and pharmacology and therapeutics. There is an examination at the end of each of these 3 phases and sometimes an examination in the paraclinical subjects in the middle of the clinical phase. It is usually not possible for a student to progress from one phase to the next until he has passed the examination. After the final examination, universities award the degrees of Bachelor of Medicine and Bachelor of Surgery. In addition to this, or in place of it, students may take a variety of diplomas - such as the Licentiate of the Royal College of Physicians and membership of the Royal College of Surgeons which also allow them to become "provisionally registered" by the GMC. After this they are required to do 6 months in an approved hospital post in medicine and 6 months in surgery before they may be fully registered.

In practice in England, Wales and Northern Ireland (though not in Scotland, where the system of school examinations is a little different) most applicants to medical school, who are acceptable, have reached a sufficiently high standard in physics, chemistry and biology to be excused the first phase of study and the first professional examination.

Admissions

Applications to all universities have recently been centralised and have to be made through the Universities Central Council for Admissions. Applicants may name 5 medical schools in order of preference and copies of their application are sent to each named medical school. These then offer places to those applicants they consider to be suitable, using whatever methods they choose to make their selection. Though the majority interview the most likely candidates, a number have stopped doing this except for special cases, forming their judgements on the facts and the opinions of the school headmaster, which are obtained from the UCCA application form. There is at present considerable pressure to enter medicine, there being about two and a half to three times as many candidates as there are places - although it should be said that quite a number of the applicants do not reach the required academic standards.

In several medical schools attempts are being made to refine the methods for selecting their students and it would seem probable that this trend will develop more in the future.

Premedical studies

Since most medical schools take students after their premedical subjects, not many are altering this part of the curriculum, though, here and there, new courses in cell biology are being started. In Scotland, this first year is sometimes being incorporated into a 3 year basic, medical science course with a degree in medical sciences at the end of it. This is completed before entering the clinical part of the curriculum. The arrangement is along similar lines to that suggested by the Todd Commission, where it was also proposed that there should be a number of options in different subjects open to the student. Only some would be compulsory, and the rest would gain a number of points, enough options being taken to gain a required total.

Preclinical studies

Although few medical schools have gone so far as this, several trends in the preclinical part of the curriculum are discernible. In the first place, new subjects are being introduced or given in greater depth. These are largely in the behavioural sciences and in the field of statistics. The introduction of these subjects to a curriculum which is already overcrowded is necessitating a reduction in the time devoted to the more traditional disciplines - particularly topographical anatomy. There is also a tendency in some schools to introduce interdisciplinary teaching, and to co-ordinate the teaching in different disciplines so that the same system of the body is taken at about the same time. To an increasing extent also the clinical demonstrations are given in this early part of the curriculum, to show students the relevance of the basic science subjects they are currently studying.

Most universities allow the brighter students to take an extra year at the end of this part of the curriculum, if they so wish, to study one of the basic subjects, usually anatomy or physiology, in considerable depth; and a good part of the year is devoted to a research project. At the end of this year the student is awarded an honour Bachelor of Science degree, and then reverts to the beginning of the clinical part of the medical curriculum. Some schools are attempting to broaden the scope of subjects which such students may take, and courses leading to an Honours Bachelor of Medical Sciences are beginning to appear. These courses may cover a wide range of subjects from, for example, computer techniques applicable to medicine, to aspects of sociology and social medicine.

Clinical studies

In the clinical part of the traditional curriculum students are not only given theoretical courses in the various clinical disciplines, but they are attached, in small groups, for set periods of time, to a succession of hospital units. At one time, such students played a definite part in the running of the unit. For example, during the period on a surgical unit the student would prepare his own patients for operation and, perhaps, sometimes assist at the operation; in the medical units the student's notes would form the official hospital record, and he would present his patients to the consultant during ward rounds. Since the inception of the National Health Service with higher standards of patient comfort and care and with higher hospital staffing, the student's clinical attachments have been less effective, for he has been less personally involved, and hence not so well motivated. Furthermore, the units in many teaching hospitals have become rather specialised, so that the student may not see an overall pattern of disease as treated in general hospitals. To overcome these difficulties a whole variety of changes have been made towards devoting the earlier part of the clinical time to acquiring clinical skills. In an increasing number of medical schools, students may spend some part of their time in full-time residential hospital appointments in which they are able to give definite assistance to the unit to which they are attached. In order to ensure that only very few students are, at any one time, attached to a given unit, and in order to give students the opportunity of seeing the pattern of illness in non-teaching hospitals, more medical schools are arranging that their students should be able to have attachments on approved units in non-teaching hospitals.

As with the pre-clinical stage, new subjects are being introduced or given more time in this practical part of the course. In particular, family and community medicine is being introduced to an increasing extent, and in many schools, students may accompany general practitioners on their rounds, or even be asked to investigate the social as well as medical problems of some family. More time is being given in many schools to psychiatry and to pediatrics, and in some schools a short elective period is allowed during which the student may choose his own subject.

In the theoretical teaching of the clinical stage an increasing use is being made of integrated interdisciplinary or topic teaching. In some schools this method is only used for certain parts of the course, but one school conducts the whole of its theoretical clinical teaching in this way, with the participation of all disciplines, pre-clinical and paraclinical as well as clinical.

An increasing number of medical schools are introducing an elective period, often of 3 months, but sometimes shorter, when the student can choose what he wants to do, visiting other centres either in Britain or overseas if he so wishes. In a few schools, students are given the opportunity to participate in research during their time as undergraduates, even if they do not take the extra year to get a science or medical sciences degree. Where this option is available it has been successful, and has been shown to be practical, so it would seem likely that this possibility will be more widely introduced. There would thus seem to be a tendency to formulate a necessary "core" curriculum and to allow a good deal of freedom of choice to the student outside of this "core".

Teaching methods

The increasing introduction of integrated interdisciplinary teaching has already been mentioned, but an evaluation of the place of conventional lectures and of small group seminars is taking place. There is a general tendency to hold more seminars than previously, and to attempt to give fewer lectures. It should be stated, however, that an extension of this process has many practical difficulties such as limitations imposed by the size of the teaching staff, the availability of a sufficient number of seminar rooms, and the fact that a large number of students like lectures.

Some schools have been evaluating the use of teaching machines, of tape-slides, of closed circuit television and of other types of audio-visual aids and self-instructional material. The simplest of these aids, eg tape/slide teaching material, both

synchronised and used manually, is being progressively introduced in a number of schools, and is proving very popular with the students. Closed circuit television is already fairly extensively used in appropriate situations, but programmed instruction is still very limited in its use.

4. SUMMARY

With the increasing requirement for postgraduate vocational training, the aim of the undergraduate part of medical training is becoming less directed to producing an all-round safe jack-of-all trades doctor. Instead, the aim is increasingly directed towards producing a medically well-educated, rather than a fully instructed, man who will have experienced a sufficiently wide range of medical activities to be able to make a well-informed choice as to the direction of his future medical career. In the words of the General Medical Council he should be a "liberally educated man, with a sense of duty to the community".

He will then be able to hold a succession of posts designed to give him proper vocational training in the particular aspects of medicine in which he wants to specialise - the more senior he becomes the more specialised his training. During this period he will be able to attend appropriate courses of instruction.

Throughout the whole of his career there will be available a whole variety of postgraduate activities designed to keep him abreast not only with advances in his own speciality but also with new knowledge across the whole spectrum of medicine.

A P P E N D I X I

Report of a meeting of experts on "Reform of medical education"
Strasbourg 20-21 June 1972

I. Opening of the meeting

Mr M Vorbeck (Secretariat) opened the meeting and welcomed the participants (Appendix).

He pointed out that the aims of the meeting were:

- to obtain opinions on present reform trends;

- to recommend principles for the reform of medical education which might serve national authorities as a guideline,

and that the basic working papers consisted of 9 national reports on "reform and new trends in medical undergraduate education" presented by the Federal Republic of Germany, France, Italy, Netherlands, Spain, Sweden, Switzerland, Turkey, United Kingdom.

These reports had been collected in one volume and introduced by Dr. U Friberg (Sweden).

This meeting had been organised jointly by the Committee for Higher Education and Research and the European Public Health Committee.

Miss H Roscam-Abbing (Public Health Division) then informed the participants about the activities carried out by the Council of Europe in the public health field.

II. Election of the Chairman

The meeting unanimously elected Prof. G A Smart (United Kingdom) as Chairman.

III. Adoption of the draft agenda

The meeting adopted the draft agenda (CCC/ESR (72) OJ 7) which consisted of a list of topics to be selected by the participants in order of preference.

IV. Introduction

An introductory talk on the reforms and new trends in medical undergraduate education was given by Dr. U Friberg on the basis of the above-mentioned reports. He noted that medical knowledge was developing at such an increasing rate that in the near future one should see a movement towards a greater sub-division of medical studies into specialisations and sub-specialisations. The objectives of medical education should therefore be redefined. As was said in one of the national reports the main aims would thus be "to produce a medically well-educated, rather than a fully instructed man/woman, who will have had experience of a sufficiently wide range of medical activities to be able to make a well-informed choice as to the direction of his/her future medical career". If this was accepted the whole educational system as far as medical studies were concerned would have to change:

- duration and planning of the studies (shorter undergraduate education followed by postgraduate and refresher courses; more responsible participation in clinical work);

- curricula (selection of content; introduction of new subjects such as behavioural and sociological studies; more emphasis on the human aspect of the medical profession);

- teaching and evaluation methods (lectures supplemented by work groups and personalised instruction; use of audio-visual aids, continuous evolution, careful computerised testing).

For many countries, as it was pointed out by Dr Friberg, reforms took place at long intervals because the faculties of medicine were not sufficiently autonomous to carry out the desired reforms.

Faculties of medicine should be given more freedom to enable them to keep up-to-date.

Dr. Friberg also noted that a great number of the European countries was moving towards the application of selection systems and the practice of numerus clausus.

After the debate which followed Dr. Friberg's introduction the participants agreed that medical knowledge, skills and potentials were developing at such a rate that there were severe repercussions on the system of medical education.

In general, it was felt that a doctor would need to continue to learn throughout the whole of his professional life. As a result of this, if such continuing education were to become compulsory the undergraduate period of training would no longer need to attempt to produce a safe, all-round doctor. In fact, the time had passed long ago when this was a reasonable objective of undergraduate medical education. At graduation, the student should be prepared so that he can gradually begin with further training to enter into the particular branch of medicine of his choice.

The meeting decided then to deal with the following topics:

A. the problem of "numerus clausus"

B. selection

C. curricula

D. teacher training

E. specialist training

F. new media and techniques

and reached the following conclusions:

A. The problem of "numerus clausus"

The participants pointed out that undergraduate medical education was to a large extent science-based and increasingly the behavioural sciences were playing a greater part. Such subjects could not be taught simultaneously to vast numbers of students with any degree of efficiency, for they involved practical classes and close supervision if the teaching were to be effective. Furthermore, at the clinical level it was unreasonable and socially undesirable to expect patients to be examined by large numbers of students, and here the size of classes ought to be severely limited if students were to gain the personal contact with patients which the committee considered to be essential. For this reason, unless there was some equilibrium between the facilities available for teaching and the intake of medical students, very serious problems could arise. Not least, students who failed at the end of a course of study when they had been taught under circumstances of overcrowding justifiably felt aggrieved that they had not had a fair chance. Further, if unrestricted numbers were to qualify it was likely that many would be ill-trained and a situation might well arise where a country had a large surplus of doctors.

The participants therefore recommended that where, for political or social reasons, the intake of medical students could not be restricted to accord with the proper facilities available for their efficient education, it was very necessary to ensure that adequate steps were taken to solve the consequent problems which could arise - particularly those of in-course selection and of providing alternative careers.

Ideally a country should formulate estimates of the numbers of physicians it would require in the future. In accordance with these estimates proper training facilities should be created in medical schools and selection procedures should be used to fill these places as effectively as possible.

B. Selection

The participants underlined the fact that it was important to recognise that the profession of medicine contained many different specialities, including that of general family practice, which required a wide spectrum of different skills and aptitudes. These different specialities also required different personalities, both between and within them. For this reason, where medical students were selected it was very important that refined selection techniques should not be developed to the point where the students selected were all similar in make-up. The participants emphasised that it was important nevertheless that research into selection methods should be undertaken on a wide-scale, for selection solely by secondary school performance is certainly neither efficient nor sufficient.

A necessary corollary of entrance selection was acceptance by the faculty of a responsibility for the careful training and guidance of each individual student.

C. Curricula design and evaluation

The committee recognised that there was a need to maintain standards of medical education, at least on the national level. On the other hand, since in view of the rapid changes in medical knowledge flexibility in design of the medical curriculum was essential, faculties should have considerable freedom to experiment. Probably all that need be controlled would be a fairly circumscribed core curriculum which would still allow plenty of room and time for experiment, and the introduction of new disciplines, options and electives. It was considered of the utmost importance that in all countries this core curriculum should contain some basic content relating to the principles and practice of community and preventive medicine.

It was felt to be important for university faculties, when designing the undergraduate curriculum, to seek information from all relevant sources such as students and recently qualified physicians from outside the faculty, as well as within - for example, from practising community doctors and from responsible lay opinion. This, together with the flow of information from the community at large, would act to modify continually the objectives to be attained by undergraduate training.

Careful research would need to be undertaken by each faculty to ensure that the aims of their curriculum should continuously remain relevant to the needs of society. The development of close links between the educational authorities and all branches of the health services (including family and community medical services) would be of great importance for this purpose. Once these objectives had been defined, faculties would be able more appropriately to design the details of their curriculum, but it was felt important that some system of regular feedback from students should be built in.

Any selection of the curriculum, whether traditional or newly introduced, should be carefully evaluated to assess whether its effect was in accordance with the overall objectives which have been laid down. At a technical level evaluation was needed to assess continually the effectiveness of different educational methods.

The participants felt that there were almost certainly educational advantages in having elective periods in the curriculum - but the time allowed for these is necessarily limited. Such elective periods might include a study in some depth of an

appropriate medical subject and/or a period at another medical centre at home or abroad.

The more highly gifted, interested and well-motivated students should have the possibility of studying some relevant subject matter in great depth. This would entail additional time for these students - perhaps an extra year, and this possibility should be available as well as any electives which may be introduced into the normal curriculum.

D. Teacher training

It was recommended that teachers of medicine, whether at the undergraduate or postgraduate level, should have received instruction in teaching, learning and assessment methods.

A considerable advantage both to developing teaching skills and to curriculum development would be obtained by interchange of members of staff between countries. The participants recommended that a suitable scheme should be developed to enable such interchange to take place.

E. Specialist training

The system of health care is different in the different countries of Europe and the function of the specialist also differs. In some he may act as a consultant - only seeing patients referred from other doctors, whereas in others he may be the first person from whom the patient seeks advice. The amount and type of specialist training necessary will clearly depend on the ultimate role which the speicalist has to play. For this reason, direct and automatic reciprocity between countries in the recognition of specialist qualifications would at the present time often be unrealistic. Each country, should, however, be prepared to recognise the training and experience a would-be specialist might have had elsewhere; this might in itself be sufficient for a recipient country to accord specialist status, or some additional training and experience might first be necessary, according to the requirements appropriate to the specialist's role within that country.

F. New media and techniques

The participants recommended that careful research should be undertaken on the new media before adopting them, because "new" did not automatically mean "good".

It was also suggested that a meeting on new learning and teaching methods should be organised next year.

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